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Worldwide Report

NUCLEAR DEVELOPMENT AND PROLIFERATION

No. 168

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CONTENTS

ASIA

AUSTRALIA

ALP Socialist-Left Faction Reopens Nuclear Policy Debate (David Wilson; THE AUSTRALIAN, 30 Aug 82) 1

Northern Territory Battles for Uranium Enrichment Plant (Errol Simper; THE AUSTRALIAN, 30 Aug 82) 2

Development of Uranium Enrichment Under Study (THE AUSTRALIAN, 10 Sep 82) 3

Rail Workers Will Bar Shipments to Uranium Project (Paul McGeough; THE WEST AUSTRALIAN 10 Sep 82) 4

BANGLADESH

Energy Minister's Speech to Nuclear Science Institute (Sultan Mahmud; THE BANGLADESH TIMES, 4 Oct 82) 5

Text of Energy Minister's Speech at IAEA Meet (THE NEW NATION, 19 Sep 82) 9

Editorial Lauds Mahmud's Stand at IAEA Market (Editorial; THE NEW NATION, 19 Sep 82) 11

INDIA

Large Nuclear Fuel Processing Plant Deemed Vital (PATRIOT, 11 Oct 82) 12

Delhi Concerned Over 'Fallout' From Tarapur Issue (G. K. Reddy; THE HINDU, 18 Sep 82) 13

Parliament Panel Concerned Over Tarapur's Fate (PATRIOT, 25 Sep 82) 14

Soviet Nuclear Plant Offer May Be Spurned
(L. K. Sharma; THE TIMES OF INDIA, 23 Sep 82) 16

AEC Chief Sethna's Speech at Vienna Meet Reported
(PATRIOT, 15 Sep 82) 17

Sethna Speaks at Atomic Energy Parley in Vienna
(PATRIOT, 22 Sep 82) 18

LATIN AMERICA

ARGENTINA

'LA PRENSA' Voices Need To Inform Public of Nuclear Costs
(Editorial; LA PRENSA, 15 Sep 82) 20

Castro Madero on Nuclear Project Delays
(LA NACION, 27 Sep 82) 22

Yriart Draws Lean Months Ahead for CNEA Nuclear Plan
(Martin F. Yriart; ENERGEIA, Sep 82) 24

Further Details on High Pressure Test Circuit Published
(ENERGEIA, Sep 82) 28

BRAZIL

Briefs

NUCLEBRAS Tries To Accomodate Environmentalists 33
Fuel Elements Factory Dedication 33

CUBA

State Council Issues Peaceful Nuclear Energy Decree
(GAZETA OFICIAL, 26 May 82) 34

SUB-SAHARAN AFRICA

SOUTH AFRICA

Ability To Make Atom Bomb Claimed
(Jaap Boekkooi; THE STAR, 29 Sep 82) 45

Role of Koeberg in Power Scheme Discussed
(John Bentley, James Clarke; THE STAR, 25 Sep 82) ... 49

Physicist Reports on Threat of Koeberg Melt-Down
(THE CITIZEN, 8 Oct 82) 55

Briefs
Faith in Nuclear Power 56

WEST EUROPE

FRANCE

New Effort Underway To Export Nuclear Technology
(Didier Duruy; LES ECHOS, 1 Sep 82) 57

Saint-Laurent-B Plant Has Mechanical Problems
(Didier Boret; LES ECHOS, 9 Sep 82) 62

Briefs
Nuclear Plant for China 64

AUSTRALIA

ALP SOCIALIST-LEFT FACTION REOPENS NUCLEAR POLICY DEBATE

Canberra THE AUSTRALIAN in English 30 Aug 82 p 1

[Article by David Wilson]

[Text] THE Victorian Labor Party will hold a special conference to debate the Federal ALP's uranium policy.

The conference will be held on October 3 and is expected to attract a "full house" of delegates.

The party's administrative received a petition from more than 60 State conference delegates at its meeting on Friday night.

The petition called for a special State conference to discuss the issue.

It followed a recent meeting of more than 400 ALP members who voiced strong opposition to the uranium policy adopted by the Federal ALP at its national conference last month.

The new uranium policy allows for a Labor government to "phase out" the uranium industry but removes the obligation to immediately repudiate existing uranium contracts.

The State secretary of the Victorian ALP, Mr Bob Hogg, a member of the party's Socialist-Left faction, moved the modification in the ALP's previously uncompromising attitude to the export and mining of uranium.

Shortly after the national conference Mr Hogg was excluded from the Socialist-Left faction and a bitterness has emerged within the group over the uranium issue's treatment at the national conference.

Mr Hogg said last night that he opposed a special conference

He said that he believed the issue should be debated three weeks later at the party's scheduled State conference.

He said the special conference would seek a review of the ALP's uranium policy and a special national conference to examine the policy.

The decision to hold a special conference is certain to give the Prime Minister, Mr Fraser, more ammunition with which to attack the Cain Labor Government.

Moderates within the Labor Party claimed that the special conference would be interpreted as a victory for the Socialist-Left faction even though opposition to the mining and export of uranium had a strong following within all factions of the party.

CSO: 5100/7501

AUSTRALIA

NORTHERN TERRITORY BATTLES FOR URANIUM ENRICHMENT PLANT

Canberra THE AUSTRALIAN in English 30 Aug 82 p 3

[Article by Errol Simper]

[Text] THE Northern Territory Government is using "community and union acceptance" of a uranium enrichment industry to persuade the Federal Government that it was wrong in deciding not to site a $1600 million enrichment plant in the Territory.

The Territory's Minister for Mines and Energy, Mr Tuxworth, has told the deputy Prime Minister and Minister for Trade and Resources, Mr Anthony, that such a plant would be accepted by 83 per cent of the population in the Northern Territory.

Mr Tuxworth said last night the Uranium Enrichment Group of Australia – a high-powered industry group which conducted the first detailed studies into the feasibility of an Australian enrichment plant – had rejected the Territory as a suitable site.

In April last year *The Australian* revealed exclusively that the enrichment group had recommended the establishment of an Australian enrichment industry.

It is understood the Territory, which has four major uranium mines – Koongarra, Jabiluka, Nabarlek and Ranger – was ruled out largely on the grounds of climate and the capital cost of necessary infrastructure.

It is believed all Australian States – except Victoria, NSW and Tasmania – not only offered to house an enrichment industry, but nominated specific sites. None of the interested States has yet been told they had been chosen.

Mr Tuxworth has told Mr Anthony the group has "overemphasised the technical factors associated with constructing the plant in the Territory and attached too little importance to community attitudes and the recently re-activated ACTU opposition to the uranium industry".

He said in Darwin last night that rejection of the Territory – where a great many unionists were happily employed in the nuclear industry – was particularly unfortunate in the light of "the fresh emergence of active ACTU opposition to the uranium industry".

He is urging the enrichment group to "re-assess" the matter, taking into account "the fact that union and community acceptance are themselves important cost factors".

Mr Tuxworth said: "Community identification of the enrichment plant as part of an established industry is an added benefit derived from a Northern Territory location."

The proximity of the Territory's Alligator River uranium province would ensure "all stages of the uranium cycle remain within the control of one government and in the domain of largely sympathetic employee organisations".

A few days ago the Queensland Minister for Mines and Energy, Mr Gibbs, said State Cabinet had recently discussed a proposal from the French Atomic Energy Commission to set up an enrichment facility in Queensland.

South Australia – home of the $1000 million Roxby Downs uranium, copper and gold find – recently prepared an indenture bill which would allow a conversion plant to be built.

The conversion of basic uranium oxide – yellowcake – to uranium hexafluoride is the first step in the enrichment process necessary before the fuel can be used in nuclear reactors.

CSO: 5100/7501

AUSTRALIA

DEVELOPMENT OF URANIUM ENRICHMENT UNDER STUDY

Canberra THE AUSTRALIAN in English 10 Sep 82 p 26

[Text] FOUR large resource development companies making up the Uranium Enrichment Group of Australia are studying the developing of a uranium enrichment plant in Australia with the blessing of the Federal Government.

CSR, BHP, Peko Wallsend and Western Mining Corp have invested $5 million in a feasibility study for the plant which would triple the export value of local yellowcake by purifying it to a suitable grade for commercial power generation.

At this stage UEGA appears likely to go for the gas centrifuge uranium enrichment process which was pioneered by Urenco-Centec, a Dutch, British and West German group of companies.

Urenco, with plants in Almelo in the Netherlands and Capenhurst in the UK, to be followed by a third in 1985 at Gronau in West Germany, is one of the front-runners in the Australian enrichment stakes.

Company officials in Almelo hope to welcome Australia as the fourth Urenco country by the middle of this decade, offering it access to its high technology through a partnership.

Urenco says it offers advantages in world markets.

Because its advanced gas centrifuge process requires very little energy, it is not only cheaper, but also offers a reasonable guarantee of long-term stability.

A Dutch scientist, Professor Kistemaker, is the brains behind the gas centrifuge system.

In the Urenco process, uranium in the form of gaseous uranium hexafluoride is fed into centrifuges which rotate at very high speed. The exact speed is a company secret, as are the height and diameter of the centrifuges.

Expansion

The heavier U238-bearing molecules drift to the outside wall while those containing U235 atoms accumulate nearer to the middle of each centrifuge.

The separation process is enhanced by inducing a gas circulation within the centrifuges, producing a concentration gradient along the length which allows enriched and depleted gas to be removed at opposite ends of the rotor.

A single centrifuge achieves only a small degree of enrichment, so many thousands of them are connected in cascades resembling automated milk factories, each producing uranium enriched to about 3 per cent.

The enriched uranium hexafluoride gas flows from one end of the cascade system and is cooled into transit containers for shipment to the fuel fabricator.

Urenco's centrifuge machines are designed to operate for more than 10 years without maintenance.

Urenco's expansion is non-speculative. It has as its main foundation a requirement-orientated build-up program, matching the construction of enrichment capacity to actual demands secured by contracts.

This policy is possible because Urenco centrifuge plants can be constructed economically on a modular basis in small capacity steps and on a very short lead time.

One such module is capable of supplying the enrichmend for a nuclear power plant of 1300mW.

In spite of the substantial reduction in nuclear power plant construction since 1974, Urenco's growing order book has led to a steady expansion program.

Total enrichment capacity in the Netherlands, Great Britain and West Germany will pass 2000 tonnes of separative work per annum by the mid 1980s and is expected to reach 5000 tonnes per annum by the mid 1990s.

CSO: 5100/7502

RAIL WORKERS WILL BAR SHIPMENTS TO URANIUM PROJECT

Perth THE WEST AUSTRALIAN in English 10 Sep 82 p 4

[Article by Paul McGeough]

[Text] **WA railway workers have told Westrail that they will not allow the loading of supplies for the proposed Yeelerrie uranium project, 650km north-east of Perth.**

The Australian Railways Union reported to a meeting recently convened by the Trades and Labor Council that Westrail had sought its views on the freighting of up to 90,000 tonnes of consumer products to the project site each year.

The union's decision will have a bearing on the project's final feasibility study which Western Mining Corporation has completed with the exception of "minor variations."

The corporation's director of operations, Mr Keith Parry, said yesterday that a final go-ahead on the uranium-vanadium project was not likely for six to 12 months.

This was a little later than expected because of the withdrawal from the $320 million project by Esso Exploration which had held a 15 per cent share.

WMC was talking to potential overseas customers and shareholders and was confident that the project would go ahead.

Mr Parry said that WMC would worry about union bans after it had made a decision to proceed with mining.

Two of the three transport options being considered by WMC involve taking supplies in and produce out for at least part of the journey by railway.

The options are:

- Through Geraldton by road.
- Through Esperance by rail to Leonora and then to Yeelerrie by road.
- Through Fremantle by rail to Leonora and then by road to the mine site.

Apart from the consumer supplies, more than 50,000 tonnes of caustic soda and more than 70,000 tonnes of fuel oil a year will be required at the mine. Transport will be needed to get an estimated 3500 tonnes of yellowcake and vanadium oxide to markets.

So far the stand taken by the rail union is the strongest in the latest TLC debate on the future of the project.

Building trade unions have said they will ask workers not to participate in the project. But if they are going to work at Yeelerrie the unions will cover them.

The Australian Workers' Union, which would cover most of the production workers, has a policy that allows uranium mining.

The Waterside Workers' Federation has decided to support the ACTU policy against the industry only if other unions act to prevent exports.

CSO: 5100/7502

ENERGY MINISTER'S SPEECH TO NUCLEAR SCIENCE INSTITUTE

Dacca THE BANGLADESH TIMES in English 4 Oct 82 pp 5, 7

[Excerpts from the speech of Air Vice Marshal Sultan Mahmud B.U., Deputy Chief Martial Law Administrator and Minister for Energy and Mineral Resources, delivered at the Institute of Nuclear Science and Technology, Atomic Energy Research Establishment at Savar, Dacca, of Bangladesh Atomic Energy commission]

[Text]

I must first thank you and the community of Atomic Energy Commission for affording me the opportunity to be with you, and if you will permit the indulgence, be a part of you, and thank the distinguished guests to be with us this morning at the premises of the research establishment of the Atomic Energy Commission, to perhaps what I would like to say, some transactions of opinion on the Energy Prospects and the Role of Atomic Energy in Bangladesh", which I hope and pray will sufficiently energize the minds of some of us. whom I fear are becoming vulnerable to institutional inertia.

Whatever the aspects of our policy, the need for new departures is apparent. The issues which have gone unresolved for a decade, no longer permit delay. At every turn, we confront directly and urgently to choose between necessities. It is futile now to debate the causes of this state of affairs. However, nor has this period, if I may reassure you, been without significant achievements.

No country can live in total isolation.

As such, your performances will be measured against relative standards. And it may not appear well. So, your possibility of an honourable survival and continuance as one of the most esteemed institutions of our country that can play an enormous role in almost all concervable aspects of our life, has dangerously narrowed.

We can and we will shape our future. There is a little prerequisite, however, is that we give up our illusions. We are no longer invulnerable. The easy remedies have been thought of and probably are talked about in the cafes. We must be ready to face complexity. Above all, we must not delude ourselves about the gravity of our position.

You must be ready to stand alone and confront unresolved problems with Faith and Courage. In a world of today. this could hardly be otherwise. The only surmountable yardstick has to be your professional pride and dedication.

Allow me, without further preamble, to broach on the subject for which I have come to spend some-time with you on "Energy Prospects and Role of Atomic Energy in Bangladesh".

Looking at the international scene, it has become clear that the known reserve on non-renewable fuels like coal, oil and gas will not be adequate to meet the energy demand of the world for long Research and development activities are, therefore, conducted everywhere for utilising new source of non-renewable and renewable energy. They include solar, geothermal wind, biomass, fuel-wood. charcoal, oilshale, tar sands, ocean, peat, etc.

The energy situation in Bangladesh is far from satisfactory. Considerable amount of our rural energy requirements are met by so-called traditional fuels like firewood animal waste, dry leaves, twigs, rice husks, jute-sticks etc. Many of these sources are rapidly dwindling and these sources are unable to cope up with the rising need of the increasing population. As a result, unhealthy deforestation leading to erosion and desertification is taking place. Such a process of ecological imbalance cannot be allowed to continue.

With the development of the country, the role of traditional fuel will be a diminishing one, since a major part of the demand increase, in future years will be for commercial types of fuel—a form of energy which enable a country to increase its GNP more efficiently than traditional forms of energy.

The total commercial energy resource of the country amounts to about 1670 million tons coal equivalent. The coal resource is estimated to be over thousand million tons. The deposit lies between 3 to 4 thousand feet below the alluvial soil and its exploitation poses some technical problems. About 68 million tons coal equivalent of peat deposits occur in good rice growing areas which go under water during the monsoon season.

Of the limited hydropotential, Kaptai could ultimately produce about 230 MW and the Sangu river site can probably be harnessed for 90 MW. Detailed feasibility work needs to be carried out about sites like Ganges or Brahmaputra barrages for deciding their potential.

Our most important commercial energy resource is natural gas. Of which, we have a proven reserve of approximately 11 trillion cubic feet. It is obvious that we have to rely heavily on this resource to meet our energy needs. However, the inadequacy of the gas resources will be clear from the fact that if Bangladesh tries to achieve the very modest target of per capita commercial energy consumption of 200 kg coal equivalent by 2000 A.D. (present consumption being about 45 kg coal equivalent per head) mainly through use of natural gas and hold the consumption level constant thereafter, then the present gas resources will be exhausted in about thirty years.

I *should, however,* like to make it clear that there is much of our land, yet to be explored. Bangladesh is a highly prospective area for accumulation of hydrocarbons. We have so far discovered gas, mainly in the eastern zone. Search for oil and gas in the past was done by commercial oil companies who concentrated on the eastern zone after the initial discovery in this region. Western zone has also prospective structures in the vicinity of Bagerhat, Chalna and Kutchma in Bogra, what is mostly known as the Hinge-zone.

Oil has so far not been discovered. It is expected from the geological structure of our land that oil may be found at deeper level than the presently discovered gas-bearing zones. Drilling at such depth requires caution, high engineering skill and higher quantum of investment. While our engineers are conversant with technology of shallow-depth drilling, acquiring knowledge for deep drilling has only started. We are, indeed, hopeful of finding oil, once deep drilling at prospective zones can be undertaken in statistically significant numbers. In this regard, some offshore areas of Bangladesh which is an extension of the on-shore gas-bearing structures, have also good prospects. As you know, six oil companies had in the recent past done exploration, including drilling in these areas and gas was found in Kutubdia in commercial quantities. Analysis of data from these surveys is likely to pinpoint locations for more intensive search.

Exploration for uranium and thorium resources are also going on in the country. Radiometric anomalies have been discovered in some areas of Sylhet, Chittagong and Chittagong Hill Tracts. Beach Sands at Cox's Bazar have shown deposits of heavy minerals which can be commercially exploited.

In view of our limited fossil fuel resources, Bangladesh, as you know, has been trying for a long time to install its first nuclear power plant. The necessity of nuclear power plant in this country has been established through a number of feasibility studies in which the International Atomic Energy Agency (IAEA) rendered valuable assistance. Unfortunately, our efforts have not been successful so far, mainly because of lack of required finance. It may be mentioned in this connection that in the IAEA review report on selection of a reactor for the Roop pur Nuclear Power Project of Bangladesh prepared in May 1982, it was mentioned that an "International Demonstration Reactor with a special warranty of the supplier and wide distribution of risk could possibly represent a novel approach towards the solution of the problem".

It was suggested by us in the last meeting of the Board of Governors of the IAEA that a demonstration reactor of 300 MWe could be constructed in a developing country as a joint venture of the country supplying the reactor, the IAEA and the recipient country. We have also offered the necessary site, manpower and infrastructure, as far as available in Bangladesh, for the proposed demonstration reactor. I hope that the IAEA will initiate such a programme and help secure the necessary finance. I am hopeful that friendly developed countries and other international organisations will co-operate with IAEA in implementing this idea. The benefit of experience of such a project can flow to other developing countries.

A large fraction of our hard earned foreign exchange is spent to pay the bills of fuel import. I feel, and I am sure, you do too that there is great need, as well as scope, for exploring alternative sources of energy, maximising and diversifying uses of indigenous resources, substituting high cost fuels as far as practicable, minimising deforestation etc. In order to study these problems and the ones associated with assessment of requirements, survey of resources, efficient production and utilisation of energy, efforts in different disciplines are necessary.

Atomic Energy Research Establishment is a multidisciplinary research centre with supporting facilities like computer, workshop, electronics laboratory, engineering laboratory, etc. It can possibly offer a good venue for activities in these vital areas of national development. Research works in the energy field are now being carried out in an uncoordinated manner in different laboratories of the country Establishment of an Institute of Energy in this campus for planning, coordinating and executing research projects on the subject will be given due consideration.

I would now like to turn to the research activities of the Bangladesh Atomic Energy Commission which is now engaged in the peaceful application of atomic energy in the fields of agriculture, medicine Industry, electronics and other areas of interest to the nation.

Talking of agriculture, the atomic energy programme includes works on improvement of the variety of food and cash crops, determine methods for optimum use of fertilizer, finding the extent of micro-nutrients in the soil and efficient use of water with isotope techniques. The Institute of Nuclear Agriculture was awarded the President's Gold Medal in 1981, for which, though belated, I would like to congratulate the Scientists concerned. Its present transfer to the Ministry of Agriculture to form a coherent research programme, along with other Agricultural Research Institutes of the country, is also a measure of its success.

In the field of medicine, the Atomic Energy Commission has set up Nuclear Medical Centres in Dacca, Chittagong Rajshahi and Sylhet. Further expansion of the programme throughout the country is envisaged and I hope that the benefit of nuclear medicine can reach the door—steps of common man.

I understand that the biological scientists of the Atomic Energy Commission have successfully carried out studies in radiation biology resulting in methods of preservation of food and sterilisation of medical instruments. Pilot scale operation is in progress to determine the commercial viability of the preservation of perishable food and vegetables like potatoes and onions as well as fresh and dried fish I can see that this programme has a large potential in reducing wastage in agricultural production. The research workers and industrial enterpreneurs should now get together for large-scale application of the method.

One of the most important pieces of work in which BAEC scinetists are engaged is in the field of health physics and environmental monitoring. In fact it is for this activity that nuclear regulatory bodies like BAEC are essential and the Government is soon going to introduce necessary legislative measures for radiation protection and nuclear safety. In the meantime, the radiation levels of X-ray installations of the country and radioactivity present in the environment are being constantly monitored.

With the industrialisation of the country, the question of quality of production will become increasingly important and nuclear techniques can be applied in quality control methods. At present gamma radiography techniques are being used to test the weld quality of pipeline joints, pressure vessels, boilers, etc. and soon activities in industrial radiography will extend to quality control of products with the help of newer radioisotopes and radiation sources

I am happy that the Bangladesh Atomic Energy Commission is now entering the second phase of its programme by establishing modern scientific laboratories in the Savar Establishment. The principal facility is going to be a research reactor. The installation and operation of the reactor will undoubtedly be a technological achievement. Radioisotopes will be produced at home and research and development work can be conducted in physical biological and engineering sciences. I am sure that the reactor installation work will proceed as scheduled.

I have observed some research and development in this premises in the field of electronics. Scientists have to go a long way to achieve the target. Your primary task should be to recruit and train necessary skilled manpower. Next comes selection of problems of interest to the Institution and the country, and carrying out R&D work before entering production phase. There is a storehouse of available knowledge in this field and advantage should be taken of this first.

The Atomic Energy Commission did some pioneering work in the introduction of computer science in the country and I am glad that they are now in the process of setting up a computer of the 4th generation in this campus This will add to the existing facilities in the country in fulfilling the computational requirements or in scientific, commercial, technical and business data processing.

One of the important byproducts of Atomic Energy Programme is the development of new technologies and building up of infrastructure for research and development. The Savar Establishment, when completed, will not only fulfil the requirement of the scientists to carry out advanced work in atomic energy and related fields but new areas of research and investigation work will emanate from here. Space Science has already found an important place in our applied programmes. We should now look towards the ocean and probe its depth for the vast resources that exist in the Bay of Bengal. Our water is equal the size of our land. Other Institutes of advanced research, especially those needed to explore our resources, monitor the environment and improve production, could be set up to take advantage of the scientific infrastructure being built here.

No nation can prosper and be self-reliant without the application of Science & Technology. Atomic Energy programmes, being multidisciplinary and sometime inter-disciplinary in nature, could lay the foundation of such a base of science & technology. I shall be happy to see colse cooperation amongst the scientists of various disciplines not only inside this campus, but a growing interaction between different research and educational institutions. Modern research involves team work in over-lapping areas as well as disciplines, to produce timely and desired results. I am sure scientists will live up to our expectations.

The Government has clearly and unequivocally expressed its commitment to the peaceful uses of nuclear energy by becoming a party to the Nuclear Non-proliferation Treaty (NPT) and by signing the Safeguards Agreement with the International Atomic Energy Agency (IAEA). Bilateral agreement on peaceful uses of Atomic Energy has also been made with the United States and France. I am sure, our friends will assist us in our efforts to use peaceful atom for national progress. IAEA has been helping Bangladesh in many ways, especially in training of manpower. I am hopeful that other international agencies will also join in this area of activity.

Here, as I come to a closure of my views, I would like to sound a note of warning to those who are apt to use the word, Technology Transfer. Technology is and has to be acquired. Much that you may desire, your accomplishments to be admired by our countrymen. You have yet not been able to succeed in making either your values or credibility be equal to their hopes and aspirations. So, you shall have to confront the unresolved problems and improvise a response under pressure of events. Therefore, your attitudes cannot remain passive. History assures a guarantee of eventual success.

Creativity, innovations, sacrifice pale before trifle considerations of day to day concerns. Our generation will live in the midst of change. The success of your actions will be falsely measured by your short-term gains. It will probably be only defined by whether we can shape the currents of our time in the light of our values. You are a community of professionals, who are unlikely to be rewarded immediately on your accomplishments. And I would like to assure those who may seek assistance, of my concern and also the need for patience and dilligence to go through a painful period of construction.

Our ability to master the time will be a measure of our worthiness as an individual, institute and a nation.

CSO: 5100/7069

TEXT OF ENERGY MINISTER'S SPEECH AT IAEA MEET

Dacca THE NEW NATION in English 19 Sep 82 p 3

[Text] Following is the full text of the speech of Air Vice-Martial Sultan Mahmud, DCMLA and Minister for Energy and Mineral Resources, delivered at the IAEA Conference held in Vienna on 'Nuclear Power Experience' on Sept. 13 :

Mr. Chairman and distinguished delegates,

First of all I would like to express my gratitude to the Director-General of the International Atomic Energy Agency for affording me this opportunity to address such an august gathering. I indeed consider it an explicit privilege. I am sure your deliberations in this week will open new vistas in the field of nuclear power.

On the 25th year of founding of the IAEA, we note with happiness the contribution of the Agency in promoting peaceful uses of the atomic energy in field as diverse as agriculture, medicine, electronics, mineral survey and above all, nuclear power.

On a global basis, it is often said that sufficient commercial energy resources are available to last a few centuries. This, however, is of little consolation to the developing countries with scarce resources of their own.

THIRD WORLD

The early promise of nuclear power as a cheap and abundant source of energy has remained, more or less. unfulfilled as far as the Third World countries are concerned. The Agency had, since its inception, carried out a number of market surveys and nuclear power planning studies, for introduction of nuclear power in developing Member States.

IDR CONSTRUCTION

It had also convened a number of meetings of possible reactor suppliers and purchasers of Small and Medium-sized Power Reactors (SMPRs), which are suitable for the developing Member States. Unfortunately, in spite of considerable efforts of the Agency, if you permit my indulgence, nothing very tangible resulted from all these studies, meetings and panel discussions. Although there were reactor manufacturers willing to sell and developing Member States willing to buy, and cost of nuclear power was found compititive even at small sizes compared to that from fossil fuel, the heavy initial capital could not be arranged for. In order to break the stalemate and generate confidence among the financial entrepreneurs, I would like to put forward, for consideration of this august gathering, a proposal for the construction of an International Demonstration Reactor (IDR) in the SMPR range in a developing Member State, to be sponsored by the Agency.

JOINT VENTURE

An IDR with special warranties of the supplier and with financial risks distributed widely among various parties could help both in demonstrating provenness as well in obtaining finance for such a plant. This could be a joint venture of the IAEA, the lending asencies, the country supplying the reactor and the recipient Member State. It should not be regarded as the Agency's entry into the commercial aspects of nuclear power. The Agency as a catalyst to demonstrate the viability of nuclear power in the SMPR range. It will also include issues like efficient management of nuclear power project, manpower developing etc. I would propose that the Agency convenes a meeting of international financing organisation like the World Bank, the Asian Development Bank, the OPEC Fund, the Saudi Fund for Development, the Kuwait Fund and other interested private financing agencies, as well as delegates from countries having interest in SMPR export, SMPR manufacturers and prospective SMPR buyers to consider the proposal of an IDR. The accomplishment of this proposal will generate the following benefits:

(a) The concept and economics of an IDR will be tested under the present day criteria and conditions prevailing in developing Member States :

(b) IAEA's role in acting as a catalyst for arranging finance for reactors in developing Member States will be tested and

(c) North-South dialogue on transfer of technology will be effectively implemented under the auspices of an international organization. Thus evolving mechnism for technology transfer in the nuclear field.

N-PLANT IN BANGLADESH

I would now like to draw your attention, Ladies and Gentlemen, to the feasibility of establishing a nuclar power station in the western zone of Bangladesh. We have few proven energy resources and have very little scope for hydro-power generation because of the terrain features of the country, as such, we are compelled to import at a prohibitive price, oil for electricity generation. It needs, I am sure, no greater emphasis for us to accede that increased use of energy is vital for the development of any country. This could be met, amongst other alternatives, by nuclear power. Need for unclear power in Bangladesh has been established through many feasibility studies carried out in the past. A site has been selected, acquired and cleared for constructions to begin, Survey of local capabilities in construction of a nuclear power station has been made Nuclear regulatory activities have been geared up. These will be discussed in detail by our representatives during the Technical Sessions of this Conference.

It is obvious that we lack the resources to finance the installation of a nuclear reactor. Nontheless. Bangldesh has gone a long way in the application of Atomic Energy in the field of Agriculture, Medicine Food, Preservation etc. I, on behalf of the Bangladesh Government, offer the site, manpower and other infrastructure facilities as far as available in Bangladesh for installing the IDR. Bangladesh is a developing Member State and a signatory to the NPT. I would further like to assure the Conference that if the IDR is built in Bangladesh. we would make such a facility available for on the-job training and dissemination of information to other Member States who many desire to have access to this facility.

PEACEFUL APPLICATION

I am indeed hopeful that this august gathering of most renowned intellectuals in the nuclear world, will consider ways and means of establishing nucalear power as a reliable and economic source of energy both for developed and developing countries to meet the future needs of energy. I firmly believe that the International Atomic Energy Agency, under the dynamic leadership of the Director General, will spearhead a new movement in the peaceful application of atomic energy. We would also like to seek the co-operation of nulear power nations through the IAEA in the development of nuclear power in Bangladesh,

CSO: 5100/7003

BANGLADESH

EDITORIAL LAUDS MAHMUD'S STAND AT LAEA MEET

Dacca THE NEW NATION in English 19 Sep 82 p 5

[Editorial]

ENERGY CRISIS

While addressing the international conference on nuclear power experience about the role of International Atomic Energy Agency (IAEA) in promoting nuclear power in developing countries at Vienna Deputy Chief Martial Law Administrator Air Vice-Marshal Sultan Mahmud urged upon the agency to sponsor in the construction of an international demonstration reactor (IDR) in Bangladesh. He suggested that IAEA could act as a catalyst to demonstrate the all-out viability of nuclear power in the small and medium sized power reactor (SMPR) range. The international demonstration reactor could be a joint venture of IAEA, the leading agencies, the country supplying the reactor and the recipient member country, especially of the Third World.

In the context of energy shortage which deters development in the Third World, this suggestion merits immediate attention. These countries have to spend almost all their export earnings to foot their oil bill alone.

Therefore, it is imperative that the potentialities of nuclear power as a cheap and abundant source of energy should be exploited by the developing nations. But most of these countries lacking financial capability need to be financed by financing organisations like World Bank, Asian Development Bank, OPEC fund and other international or private agencies. Arranging finance for installation of nuclear reactors by IAEA may be a step towards implementation of North-South dialogue on transfer of technology from the affluent to the poor.

The DCMLA observed that Bangladesh possesses necessary manpower and infrastructural facilities to install a IDR. Studies carried out in the past have already confirmed the feasibility of establishing such a plant in Bangladesh. Bangladesh, a signatory to Nuclear Non-proliferation Treaty (NPT), has also offered training facilities to personnel and dissemination of information regarding nuclear reactor to the member countries. This factor further strengthens her claim for priority.

Besides, feasibility study should be carried out in other countries. While doing so, care should be taken not to disturb the ecological balance by polluting the atmosphere with release of chemicals from the N-plants. In absence of a tight security and safety the basic purpose of development will fail. To reduce the widening gap between rich and poor countries the latter have no alternative but to rely on nuclear power which will ensure rapid industrialisation. But, the energy should be used for peaceful and developmental purposes and not for armaments.

CSO: 5100/7003

LARGE NUCLEAR FUEL PROCESSING PLANT DEEMED VITAL

New Delhi PATRIOT in English 11 Oct 82 p 8

[Text]

BOMBAY, Oct 10 (UNI) — A big and central fuel reprocessing plant may become necessary if the growth and size of the domestic nuclear power programmes so warrants it in future.

Such a plant could be located at an independent site serving many nuclear power stations. But geographical and infrastructural factors play an important role in arriving at a decision, according to an article in the special issue of 'Nuclear India'.

The favoured capacity of the reprocessing plants in the country at present ranges between 100 and 200 tonnes annually.

While in industrialised countries large capacity centralised reprocessing plants may be favoured for achieving economies of scale, apart from other considerations. Experience has shown that the optimum capacity of such a plant is essentially a function of the parameters specific to the country in which it is located, the article says.

According to the article, the prominent parameters are the growth of spent fuel arising from the installed nuclear capacity, average capacity achievable, the useful life span of the plant, infrastructural constraints such as transport problems and environmental considerations.

The nuclear power programme in India envisages the achievement of an installed capacity of about 10,000 mw by the year 2000. This will be achieved by building a series of power stations comprising 235 mw reactors initially followed by 500 mw units later.

The technological base for reprocessing irradiated nuclear fuels has been well-established in the country and research and development efforts are mainly directed to strengthen the base.

Application of lasers in the nuclear sphere has opened up new vitas for further work and its potential use is being studied. Introduction of electrochemical method is also being considered.

CSO: 5100/7008

DELHI CONCERNED OVER 'FALLOUT' FROM TARAPUR ISSUE

Madras THE HINDU in English 18 Sep 82 p 9

[Article by G. K. Reddy]

[Text] NEW DELHI, Sept. 17.

The Secretary-General of the French Foreign Ministry, Mr. Fran[illegible] Guttman, will be arriving in Delhi on October 7 for important bilateral talks with the Foreign Secretary, Mr. M. K. Rasgotra, on a number of issues including the nuclear question.

The visit of Mr. Guttman was fixed some time ago as part of the high-level exchanges under way between India and France to set the right tone for President Mitterrand's visit at the end of November to which both countries continue to attach considerable significance.

But his impending talks in Delhi have assumed additional importace in view of the persisting differences over the nature and extent of the safeguards to be applied to the French-supplied enriched uranium for the Tarapur nuclear power plant. As head of the French Foreign Ministry and also a close confidant of the Foreign Minister, Mr. Claude Cheysson, he will be able to discuss the problem at the political level without leaving it entirely to French nuclear experts.

As a prelude to Mr. Guttman's visit, the head of the French nuclear establishment, Mr. Michel Pecqueur, had a detailed discussion in Vienna with the Chairman of the Atomic Energy Commission; Dr. H. N. Sethna, in the light of the preliminary talks that took place in Delhi last week with Mr. Jacques Andreaue, the third senior-most functionary of the French Foreign Office.

Political-level talks: The tough stand taken by the French delegation at these talks left no scope at all for any accommodation on the applicability of the pursuit and perpetuity clauses. So it was decided by the two sides to elevate the dialogue to a political level to explore the possibilities of a compromise on the two inter-related provisions.

As the French are keen to get this problem out of the way before Mr. Mitterrand's visit, it has been decided that the heads of the two Foreign Ministries should personally deal with the issue at a semi-political level to narrow the differences and explore the prospects of a compromise acceptable to both sides. It is in this context that Mr. Guttman's visit is assuming special importance, since he will be coming with a comprehensive political brief to find a solution, if it is at all possible.

Govt's worry: But more immediately the Government of India is concerned about the fall-out of this nuclear controversy during the coming Parliament session which has been advanced by more than a month due to the Asian Games. The session begins on October 4, on the eve of these crucial talks with Mr. Guttman, and the Government expects a flurry of questions on the subject by the Opposition.

Both the Prime Minister, Mrs. Indira Gandhi and the External Affairs Minister, Mr. P. V. Narasimha Rao, had assured Parliament during the last session that (1) India reserved the right to reprocess the spent fuel at a time of its choice in spite of American objections; (2) the French fuel supply would be within the framework of the 1963 agreement at the existing level of safeguards with no additional obligations; and (3) the IAEA safeguards end in 1993 with the expiry of the Indo-U.S. agreement.

It will be very difficult for the Government, in the face of these categorical assurances to Parliament, to make any substantial concessions on the twin issues of pursuit and perpetuity to meet the French requirements. The elucidation offered at the recent talks that a negative pursuit clause is already in operation in the sense that India is committed not to remove the nuclear materials or derivatives from the Tarapur premises has not satisfied France.

It remains to be seen whether Mr. Guttman arrives with any new ideas that will be acceptable to the two Governments. As far as India is concerned, Mrs. Gandhi is reported to be quite firm that there can be no concession of any kind on the perpetuity question. And this has been made abundantly clear to France during the recent discussions.

CSO: 5100/7002

PARLIAMENT PANEL CONCERNED OVER TARAPUR'S FATE

New Delhi PATRIOT in English 25 Sep 82 p 7

[Text] Members of the Parliamentary Consultative Committee attached to the External Affairs Ministry have expressed concern over the fate of the Tarapur Atomic Power Station in the wake of the French Government's insistence on tying additional safeguards to the question of supply of nuclear fuel for the plant.

The issue figured at a meeting of the committee on Friday and members generally voiced their criticism of the Government of India's handling of the matter. They were, however, reassured when External Affairs Minister P. Narasimha Rao declared that India would under no circumstance accept safeguards which were not envisaged by the 1963 Indo-US agreement on supply of nuclear fuel for Tarapur.

He asserted that our stand on this question would remain unchanged.

When several members wanted to know the exact nature of progress or otherwise of the current talks on the issue held with French officials, Mr Rao said the discussions with France were still going on and he could not say anything on the matter at this stage.

The Tarapur issue was raised by Mr Chandrajit Yadav (Janwadi) when the meeting was coming to a close. He asked how the 1963 Indo-US agreement on the subject could be binding on France which was not a party to the accord.

Mr Rao explained the whole situation by saying that due to domestic compulsions the US had expressed its inability to supply nuclear fuel for Tarapur and then it had itself brought France as alternate supplier of the fuel within the framework of the 1963 agreement.

French Angle

When a member still insisted to know if France had been brought in by the US, the Minister replied in the affirmative. Mrs Margaret Alva (C-S) claimed that even when Mrs Gandhi had visited France last year the French Government had offered nuclear fuel for Tarapur. This was, however, flatly denied by Mr Rao.

Mr Stayasadhan Chakraborty (CPI-M) said the USSR had offered to supply fuel for Tarapur. The Minister denied this too.

Mr Sadashiv Bagaitkar (LD) said the Indian public were disappointed because there had been a big press buildup during Mrs Gandhi's US visit that all problems including the one related to Tarapur had been solved. The main point now, according to him, was that Tarapur was being starved of fuel.

Mr P.K. Kodiyan (CPII) asked what would happen to the fate of the 1963 accord if no agreement was reached with France regarding the conditions it is keen to impose. Mr Rao said in such an eventuality the government of India would be free to take whatever action it deemed best from its viewpoint.

CSO: 5100/[illegible]

SOVIET NUCLEAR PLANT OFFER MAY BE SPURNED

Bombay THE TIMES OF INDIA in English 23 Sep 82 p 9

[Article by L.K. Sharma]

[Text]

NEW DELHI, September 22

THE Soviet offer to set up a 1000-Mw nuclear power station in India is unlikely to enthuse the planners here since this country has evolved a specific design philosophy suited to local conditions and achieved a great degree of self-reliance.

The Soviet offer was conveyed to the Prime Minister, Mrs. Indira Gandhi, by the Soviet Prime Minister, Mr. Nikolai Tikhonov, yesterday.

In fact, the Soviet offer is not new. It was made in 1979 by the then Prime Minister, Mr. Alexei Kosygin, during his official visit here. The proposal was considered by the Janata government which did not find it acceptable.

The government did not favour larger atomic power plants in view of the "present stage of technological development in the country." The same view was taken by Mrs. Gandhi's government which said it was not "feasible" to import the unit and did not pursue this offer.

The Soviet Union is keen to sell large nuclear power units since it has built up in Ukraine one of the largest facilities to turn out power plants. The $3.9-billion Atommash complex can roll off as many as eight large reactors every year.

Except for Romania, which opted for a Candu-type reactor, the East European countries have provided a big market for the Soviet nuclear hardware.

There has been fruitful co-operation between India and the Soviet Union in nuclear sciences which is an important item on the agenda of the sub-commission of the two countries. They have agreed to co-operate in fusion research. The Soviet Union supplied the vital heavy water for commissioning the Rajasthan atomic power unit.

However, the Soviet offer for a large atomic power plant requires to be examined from various angles. It was unlikely that India would like to have another major nuclear facility under international safeguards which the Soviet-supplied plant would involve.

India has the know-how of the entire fuel cycle and has demonstrated its design and manufacturing capabilities. The construction of the Narora units will be entirely an indigenous effort. Hence, there is not much that India can gain by importing a power unit.

India has already standardised the design of a 235-MW unit and plans to establish ten more reactors. It has initiated the design development for a 500-MW unit.

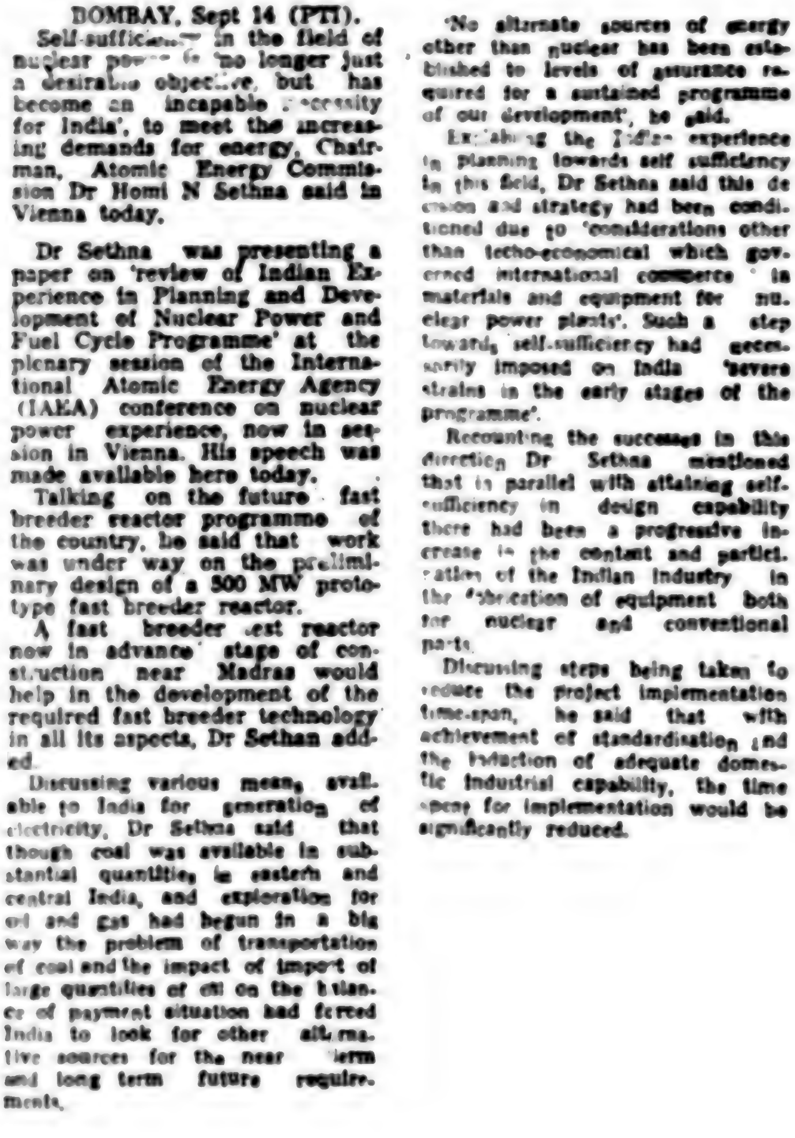
While the planned nuclear power stations are based on standard Indian design, the Soviet VVER design will introduce an external factor in nuclear planning. India does not have resources to sustain development of two alternative strategies.

CSO: 5100/7006

AEC CHIEF SETHNA'S SPEECH AT VIENNA MEET REPORTED

New Delhi PATRIOT in English 15 Sep 82 p 5

[Text]



BOMBAY, Sept 14 (PTI).

Self-sufficiency in the field of nuclear power is 'no longer just a desirable objective, but has become an incapable necessity for India', to meet the increasing demands for energy, Chairman, Atomic Energy Commission Dr Homi N Sethna said in Vienna today.

Dr Sethna was presenting a paper on 'review of Indian Experience in Planning and Development of Nuclear Power and Fuel Cycle Programme' at the plenary session of the International Atomic Energy Agency (IAEA) conference on nuclear power experience, now in session in Vienna. His speech was made available here today.

Talking on the future fast breeder reactor programme of the country, he said that work was under way on the preliminary design of a 500 MW prototype fast breeder reactor.

A fast breeder test reactor now in advance stage of construction near Madras would help in the development of the required fast breeder technology in all its aspects, Dr Sethan added.

Discussing various means available to India for generation of electricity, Dr Sethna said that though coal was available in substantial quantities in eastern and central India, and exploration for oil and gas had begun in a big way the problem of transportation of coal and the impact of import of large quantities of oil on the balance of payment situation had forced India to look for other alternative sources for the near term and long term future requirements.

'No alternate sources of energy other than nuclear has been established to levels of assurance required for a sustained programme of our development', he said.

Explaining the Indian experience in planning towards self sufficiency in this field, Dr Sethna said this decision and strategy had been conditioned due to 'considerations other than techo-economical which governed international commerce in materials and equipment for nuclear power plants'. Such a step towards self-sufficiency had necessarily imposed on India 'severe strains in the early stages of the programme'.

Recounting the successes in this direction Dr Sethna mentioned that in parallel with attaining self-sufficiency in design capability there had been a progressive increase in the content and participation of the Indian industry in the fabrication of equipment both for nuclear and conventional parts.

Discussing steps being taken to reduce the project implementation time-span, he said that with achievement of standardisation and the induction of adequate domestic industrial capability, the time spent for implementation would be significantly reduced.

CSO: 5100/7001

SETHNA SPEAKS AT ATOMIC ENERGY PARLEY IN VIENNA

New Delhi PATRIOT in English 22 Sep 82 p 3

[Text] London, Sept 21 (PTI)--India today termed as meaningless safeguards in nuclear weapon states on only certain "self-selected" facilities.

Such safeguards do not serve any purpose and are a total waste of the meagre resources of the International Atomic Energy Agency (IAEA), chairman of the Atomic Energy Commission Dr H.N. Sethna told its general conference in Vienna.

Dr Sethna, who is leading the Indian delegation, is being specially honoured along with some other prominent figures in the field on the occasion of the silver jubilee of the agency. The Indian delegation includes Mr S.K. Singh, ambassador-designate to Austria who is on the agency's board of governors.

Dr Sethna said such formal safeguards can have little or no meaning as long as nuclear weapons programmes in nuclear weapon states continued unabated and unchecked.

Recalling that this was the silver jubilee of IAEA, Dr Sethna said it was a fitting occasion for all members to reaffirm faith in this organisation and its objectives as enshrined in its statute.

"Unfortunately in recent years these objectives have been sought to be eroded in building up certain concepts and issues that are and most always remain extraneous to its statute," he told the meeting.

India, Dr Sethna said, had always maintained that the primary function of agency was to promote utilisation of atomic energy for peaceful purposes and that the regulating role assumed by it "is but of secondary importance."

Calling for the removal of all forms of nuclear weapons from the face of earth, Dr Sethna recalled Prime Minister Indira Gandhi's five-point concrete programme of action in her message to UN special session on disarmament.

He drew specific attention to Mrs Gandhi's suggestion for a freeze on nuclear weapons providing for total stoppage of any further production of such weapons combined with a cut off in production of fissionable material for weapons purpose.

He reiterated India's continuing assistance to other developing countries and pledged a voluntary contribution of about 1.16 lakh US dollars. India would also contribute to make available 12 fellowships for the benefit of developing countries.

Pending a concensus on the question of financing technical assistance from regular budgets, Dr Sethna expressed India's support to the target of 19 million US dollars agreed to for 1983.

CSO: 5100/7005

ARGENTINA

'LA PRENSA' VOICES NEED TO INFORM PUBLIC OF NUCLEAR COSTS

Buenos Aires LA PRENSA in Spanish 15 Sep 82 p 1 sec 2

[Editorial]

[Text] The manufacture in this country of combustible nuclear elements necessary for the operation of the Atucha I plant can without doubt be described as a positive factor since it is an essential complement to the National Energy Commission's plan for setting up power plants for the production of electrical energy. The continued operation of the Atucha I plan, which in 1981 produced 8 percent of the energy provided through the public system, has already become essential for the daily activities of the country and it is fortunate that the fuel required can be provided without resorting to foreign supply which is subject to interruption for reasons beyond our nation's control. The fact that a second thermoelectric nuclear plan is under construction and that plans for a third are well advanced adds to the value of the production already obtained because the plant that has already started producing regularly will also be able to provide those elements for future plants.

The attendance of the national president at the ceremony at the Atomic Center in Ezeiza on the occasion of the turning over of the first 104 combustible elements for Atucha I made clear the government's desire to emphasize the significance of the technological and industrial advances which have been achieved. The ceremony was also an opportunity for a restatement of policy with regard to the implementation of the Argentine nuclear plan. It could also have been an opportunity to make clear, once and for all, that Argentina has decided against the manufacture of nuclear weapons which would have brought peace of mind to the greater part of Argentine public opinion whose traditional feelings are against the use of those horrible elements of total anihilation which, it is recognized, have the power to destroy, even though unintentionally, all of humanity.

Such a reaffirmation of the Argentine preference for worthwhile work, for peace and not for the destruction of the human race is what should have been heard at the ceremony at the Ezeiza Nuclear Center. It is no longer a secret, but rather a frightening absolute certainty that with the number and strength of the nuclear missiles that are ready for use all over the world, any trivial act could unleash, with the first destructive bomb, an uncontrollable total conflict.

This certainty, and the need to save our hemisphere from an increasingly obvious threat, years ago led our country to sign the Tlatelolco Treaty which prohibits the possesion, use or manufacture of nuclear weapons in Latin America. However, the treaty was never formally ratified even though during the presidency of Lt Gen Jorge Rafael Videla the need to do so was well recognized. The president was well as the then chairman of the National Atomic Energy Commission announced on various occasions that ratification was imminent but that decision never materialized.

On the other hand, the size of the investments which have been made makes it necessary that the country be continuously informed of the cost of the nuclear project, how much it is planned to spend, what are the secondary industries which have been established or may be established later on. It is also necessary to clarify what technical advances are being achieved and what are the reasons for insisting on the development of this source of energy, using funds and effort which could be applied to other traditional sources.

9204
CSO: 5100/2001A

CASTRO MADERO ON NUCLEAR PROJECT DELAYS

Buenos Aires LA NACION in Spanish 27 Sep 82 p 4

[Text] The chairman of the CNEA [National Atomic Energy Commission], Carlos Castro Madero, expressed his "concern" about the budget restrictions that will affect the nuclear plan, but he said that "all our institutions must make an effort to help to solve Argentina's economic problems."

Castro Madero spoke at Ezeiza yesterday, upon his return to Argentina after attending meetings of the IAEA [International Atomic Energy Agency] held in Geneva.

Delays in Atucha II

The head of the CNEA said that the budget cutbacks "will not affect" the Embalse nuclear power plant, "because it is a project that we need and it will soon be in operation," but he predicted that there will be delays in the start of operation of the heavy water plant and the Atucha II nuclear power plant.

Castro Madero attended two meetings in Geneva, one of a technical nature, at which Argentina presented six reports. One of these was about our development in the field of nuclear-generated electricity, which aroused great interest among the developing nations. He also attended a meeting of the organization's board of governors.

Safeguard Agreements

He said that "at the board of governors meeting he spoke of the need to do a study to bring into harmony the situation of the safeguard agreements established by the Non-Proliferation Treaty and the countries which are not members of that treaty, such as Argentina."

He said that his proposal was accepted, and that studies will soon begin to include the issue in the statutes. In February, at the next AIEA board of governors meeting, they will determine how well this analysis is moving.

Nuclear Submarines

He added that "at the meeting I repeated my disagreement about the use of nuclear submarines, because we feel that a nuclear power should not use this advantage against a country like Argentina which, because of its commitments to the principle of non-proliferation, is found at a clear disadvantage."

7679
CSO: 5100/2002

YRIART DRAWS LEAN MONTHS AHEAD FOR CNEA NUCLEAR PLAN

Buenos Aires ENERGEIA Spanish Sep 82 pp 672-673

[Article by Martin F. Yriart]

[Text] While EXECUTIVE INTELLIGENCE REVIEW, the U.S. journal that reports on business and state sectors in the developing world, and which is keeping an eye on Mexico now, is claiming that "London financial circles" have decided to set a quota on Latin American nuclear energy investments, and the engineer Alvaro Alsogaray, in his "minimum" program (a phraseology that recalls the old PC [Communist Party] strategies) is proposing to "revise the international commitments of the CNEA [National Atomic Energy Commission]," at the end of April the head of the CNEA began a new series of informative meetings with all levels of the CNEA, designed to explain the present situation, to answer questions, to clear up doubts, and reinvigorate the climate of this institution, of which it has often been said that it is an atypical organization within the Argentine political anatomy.

Vice Admiral Castro Madero took this opportunity at the middle of the year to present an overview of the status of the Argentine Nuclear Plan, whose salient points we will mention below.

As of 30 June 1982, Atucha I--which is now shut down for scheduled maintenance--had produced 1,511,790 gross MWh (62 percent of the goal set by the CNEA for the present calendar year) and 1,422,310 net MWh (66.6 percent of the goal agreed upon with the department of energy for 1982). During the first half of 1982, the load factor for Atucha was 97.74 percent, a figure that amazes people already impressed with the achievements of this program.

On 18 May, Atucha's second pool building received its first irradiated fuel element, thus marking the actual beginning of its operation.

At Embalse, the first 6 months of 1982 ended with 99 percent of the assembly completed; there are a few additional systems remaining which will be finished before the end of the year. In the conventional area, 90 percent of the work required for starting operations has been completed, including the testing of the turbogroup at its nominal velocity and its synchronization with the 132 Kv system. But in the nuclear area, only 20 percent of this work is finished "because of delays in the transfer of systems, due to normal problems with assembly and changes in engineering design, and also because of the lack of some minor materials." In the meantime, 81 percent of the professional operating staff and 70 percent of the technical staff have been hired.

A study conducted by Ebasco for the CNEA last May said that the date for going critical established by the Embalse contractors (Atomic Energy of Canada Ltd and Italimpianti S.p.A.), 28 November, could be delayed until the first of May next year.

According to Ebasco, the foreseeable delays may be attributed to:

1. The transfer of systems from the construction group to the operational group (7 weeks);

2. The start of operation of the primary heat transport system (6 weeks); and

3) Additional tests to be made of the high pressure cooling system (2 weeks).

This amounts to a total of 15 weeks, to which Ebasco added another 6 weeks for "any possible contingencies."

This study also showed, according to Castro Madero, the high level of the CNEA staff, the meticulous nature of the construction, and the high level of the procedures and documentation being used.

A new study undertaken to "determine the real engineering capability which AECL [Atomic Energy of Canada Ltd] has available in Canada to begin operations at Embalse and to handle changes required during the start of operation of the Lepreau and Gentilly 2 plants" is now in progress, with the participation of Ebasco and the CNEA.

The Atucha II construction schedule has been adjusted downward to suit the present situation of our national economy. This means that barely 53 percent of the work scheduled for the first half of 1982 is completed, and new purchasing orders have been suspended. Minimal levels are being maintained for supplies ordered from national sources, and investments are being held to the minimum compatible with contract commitments for imported items.

Castro Madero reported that studies are continuing for the central section. He also said that the RA-6 is expected to begin operation during September.

The situation of supplies for nuclear power plants also reflects the nation's present economic conditions. Two programs that have suffered considerably are the drilling program in the Sierra Pintada and the aerial prospecting program in Cordoba. The Cordoba program has been particularly hard hit by the continuing decline of the peso in relation to the dollar.

Net uranium reserves, in terms of "reasonably certain resources" (IAEA [International Atomic Energy Agency]), had a net increase of 313 tons of concentrate--this figure is determined by subtracting the reserves mined during this period--so Argentina's total reserves in this category amounted to 30,363 tons of U308 on 30 June 1982.

The production of concentrate remained at the expected levels, with records being reached in Malargue and San Rafael. 4.6 tons were prepared for shipment to the Soviet Union, where they are to be used to produce 20 percent enriched uranium, while another 59.4 tons were to be used to meet contract commitments with Brazil.

In Cordoba's Los Gigantes field, the programs planned for the first 6 months of 1982 were carried out at a level of 99 percent, while at La Estela in San Luis, the CNEA has given the contractor a 12-month extension to begin the delivery of ammonium diuranate, a term that will come to an end on 1 December.

The opening of bids for the Sierra Pintada field has been postponed until the end of November, because the Falklands conflict kept the Argentine firms interested in taking part from reaching agreements with the foreign firms that are to provide technology, as required in the list of conditions set by the CNEA.

In Cordoba's uranium dioxide conversion plant, final preparations have begun with the assistance of RBU (Germany) technicians, while the work in progress is being completed, and it is hoped to have the plant in operation before the end of this year.

During the first 6 months of 1982 the Nuclear Fuel Elements Plant at Ezeiza began to operate. By 30 June it had produced 65 elements of the Atucha I type, but the activities of the Special Alloys Plant have been delayed, in some areas up to 5 months, even though the results of the pilot plant's operation have been satisfactory.

Finally, at the industrial heavy water plant at Arroyito, while the production of the processing equipment by the contractor, Sulzer Bros, was 90 percent completed during the first half of 1982, the execution of the civil engineering work was barely at a level of 30 percent of what had been scheduled. 55 percent of the imported supplies were in Argentina as of 30 June.

The panorama depicted by Castro Madero does not differ in any substantial way from what was expected at the beginning of the year, which is some slight consolation. Some activities, which are now in the terminal phase of execution (Embalse, the dioxide plant, RA-6) are in a good position to receive a final dose of the resources needed to have work completed, and before 31 December the CNEA may be able to list another two or three openings in addition to those already occurring this year, of the FECN [Nuclear Fuel Elements Plant] and the High Pressure Test Circuit.

But without being overly pessimistic, we must recognize that the situation for the next few months for the CNEA is no less bleak than for the rest of our national economy.

7679
CSO: 5100/2002

FURTHER DETAILS ON HIGH PRESSURE TEST CIRCUIT PUBLISHED

Buenos Aires ENERGEIA in Spanish Sep 82 pp 666-668

[Text] A Tool for Development

The Argentine Nuclear Plan sets as a goal to achieve our national capacity of designing and building nuclear power plants. The formulation of this goal is the logical outcome of an evolution that began with the construction of small experimental reactors at first, and then continued with the growing participation of Argentine industry in providing supplies and equipment for power reactors.

This progressive development of Argentine nuclear technology, both in engineering and in industry, is creating new needs for the research and development infrastructure.

The CNEA's [National Atomic Energy Commission] High Pressure Test Circuit--also called a "loop"--responds to these needs, since it is now possible to test and develop nuclear fuel elements, critical components of reactors and high power and volume pumps with multiple applications, to simulate thermohydraulic and mechanical processes, and to acquire experience with the characteristic problems of the conventional (nonnuclear) industry, thus helping to improve designs and contribute to the development of basic engineering in Argentina.

The experience acquired is also applicable to processes involved in the inspection and repair of nuclear power plants and other nuclear facilities. The basic engineering for the High Pressure Test Circuit was done by the CNEA with the assistance of the Nuclear Research Center of Karlsruhe.

The Federal Republic of Germany, through the Argentine-German Cooperation Agreement, supplied part of the mechanical components, instrumentation, and process control.

The CNEA assumed responsibility for the detailed engineering and the direction and inspection of construction. It also prepared the manuals for the start of operation, operation, the assurance of operating quality, and maintenance of the entire test circuit. The firms Kraftanlagen A.G. and Nuclar S.A. took part in the engineering, assembly, and start of operation.

The High Pressure Test Circuit is designed to meet the demand for a nuclear fuels and components test capability, generated by the Argentine Nuclear Plan and the development of engineering and the nuclear industry in Argentina. It has a flexible design so that different types of test sections can be installed, not just for fuels or pump and valve types of equipment, but also for other types of equipment of greater complexity or size, such as loading machinery or steam generators.

With this type of facility in operation, Argentina has now moved to a leadership position in Latin America in the field of nuclear engineering.

Circuits

The purpose of the High Pressure Test Circuit is to reproduce the conditions of temperature, pressure, and flow volume to which the components of a power reactor are subject in the primary circuit of a nuclear power plant.

It has a set of equipment installed on various pipes and ducts. The main pump is installed on the so-called "primary" part of the test circuit. Its dual mission is to cause the fluid to circulate within this circuit, and to raise its temperature to 300°C. There is also a pressurizer which, through 72-kW electric heaters, can generate a pressure of up to 100 bar.

Another key component is the heater, which is used to make fine temperature adjustments at the insertion point of the component to be tested. This equipment also has valves, filters, and heat exchangers. All this is used for the test section, which is part of the primary circuit.

There is a secondary circuit designed to regulate the water's temperature and chemical purity, and to compensate its volume and flow.

Testing

A number of types of test equipment can be connected to the main circuit. The test section for Atucha-type fuel elements is a container almost 7 meters high with a diameter of something a little more than 20 cm. Within this section are reproduced the temperature, pressure, and flow conditions existing in a fuel duct of the reactor.

Two clamps in the primary circuit can be used to connect other test sections with different characteristics. In these sections it is possible to test ducts, fuel elements, valves, and spare parts for reactors of the Embalse type.

Other equipment can be used to study corrosion phenomena, which will help to provide a better knowledge of the chemistry of nuclear reactors.

The Test Bench

Three units make up the High Pressure Test Circuit facility: the main bay and tower building, the control room and control panels building, and the water treatment and auxiliary services building.

The main bay has a maximum height of 15 meters and is equipped with a 5-ton crane. This bay houses the various components which can generate the temperature, pressure, and water flow of the circuit, along with complementary facilities.

The dimensions of the main bay are adequate to install in it different test circuits for fuel elements and nuclear components, to the extent required.

The tower, which forms a unit with the main bay, has a maximum height of 30 meters and is equipped with a 3-ton crane. The height of this tower responds to the need to move about inside it, in a vertical position, fuel elements of the Atucha type, which can measure up to 7 meters in length.

The tower houses the structure of the test section for fuel elements, which reproduces the pressure, temperature, and water circulation conditions which fuel elements encounter in a nuclear reactor.

The test circuit is operated from the control room and panels building, where the circuit's control consoles are located--with direct access to the main bay--along with the electrical panels.

The operation of the circuit and the control of the experiments are handled from the control room, where all variables of the process are recorded. Finally, the High Pressure Test Circuit facility has a water treatment and auxiliary services building. This houses the water treatment plant, which uses demineralized water, and the chemical control laboratory which ensures the quality of the water.

For its electricity supply, the circuit has a yard with a three-phase transformer with a vat, which can meet the electricity requirements, which are 800 kVa at 380 volts.

Assurance of Quality

The safety of a nuclear reactor depends on the design and conditions in which the components of its primary circuit are manufactured.

Pumps, valves, seals, fuel elements, and other parts which are used in the reactor are subject to very harsh operating conditions, and must therefore respond without fail, and ensure that the reactor core will be kept adequately cooled.

All these critical components are tested in the High Pressure Test Circuit, in order to ensure that their design and construction will be adequate.

To understand its operation, we should recall how a nuclear power plant operates. A nuclear power plant of the Atucha or Embalse type, using pressurized heavy water and natural uranium, only differs from a conventional thermal plant in the fact that the nuclear plant uses a nuclear reactor instead of the furnace that burns either coal or oil.

The reactor consists of a pressurized container (in the case of Atucha) or a "calendar" through which pass pressurized tubes (in the case of Embalse) in which the fuel elements are located.

The fuel elements are clusters of hermetically sealed metal tubes; inside these tubes are the uranium pellets which supply their energy to the reactor.

The reactor is kept going because heavy water circulates between the rods; this heavy water acts as a moderator, reducing the energy of the neutrons produced during the fission of the nuclei of the uranium 235 atoms. Heat is generated in the fission process, and this heat is extracted by means of the heavy water, which also acts as a coolant.

To do this, large pumps cause the heavy water to circulate, removing it from the reactor and sending it to the steam generators. When it goes to the generators the heavy water, leaving the reactor with a temperature of about 400°, delivers its thermal energy to a light water duct which flows along the external part of the generator and transforms it into steam, which will drive the turbine.

The entire heavy water circuit is maintained in a liquid state by means of a pressurizer which controls it through electrical resistances.

Another smaller closed circuit regulates the temperature of the moderator. Various types of pumps, valves, filters, etc. also combine to make up this system, which is known as the "reactor's primary circuit."

The fuel must be constantly renewed, so a loading machine is used. This is a pressurizable bottle that can be connected to and disconnected from the reactor without causing the reactor to lose pressure. This system is used to remove depleted fuel elements which are replaced by fresh elements.

The High Pressure Test Circuit replaces the operating conditions of a power reactor, with the exception that in the test circuit there is no fission, and consequently, no neutron flow. But the temperature, pressure, and water flow are identical.

This result is obtained by the use of a powerful pump which has the dual function of driving the water through a closed circuit and raising its temperature.

A pressurizer, similar to the one used in a reactor, creates the requisite pressure, and a heater regulates the temperature at the test channel intake. The flow in this circuit is about 200 cubic meters per hour. The temperature reaches 300°C, and the pressure, 100 bar.

7679
CSO: 5100/4002

BRAZIL

BRIEFS

NUCLEBRAS TRIES TO ACCOMODATE ENVIRONMENTALISTS--Peruibe and Iguape, Sao Paulo--NUCLEBRAS has decided to modify its strategy for the installation of nuclear plants in order to accomodate the reaction of environmentalists and to be in consonance with the process of political opening now under way in the country. In Sao Paulo, where two nuclear plants will be built, NUCLEBRAS has already adopted the new strategy that consists in making heavy investments in the infrastructure of cities where nuclear plants are built. Up to now nuclear plant projects were designed as separate projects, unrelated to the host cities, by federal government decision based on the concept of national security. Henceforth, these projects will be conceived as economic projects for which regional authorities will be consulted to determine the political advisability of such projects and the possibility for implementing them as common investments. [Excerpt] [PY191336 Rio de Janeiro O GLOBO in Portuguese 18 Oct 82 p 14]

FUEL ELEMENTS FACTORY DEDICATION--President Figueiredo today arrived in Resende [Rio de Janeiro State] at approximately 1500 to dedicate a factory of fuel elements, FEC, built by NUCLEBRAS at a cost of $13 billion. The plant will produce 100 tons of uranium (?concentrate) which will be sufficient to reload for the first time a 1,000-megawatt reactor. [Excerpt] [PY210118 Brasilia Domestic Service in Portuguese 2200 GMT 20 Oct 82]

CSO: 5100/2006

STATE COUNCIL ISSUES PEACEFUL NUCLEAR ENERGY DECREE

Havana GACETA OFICIAL in Spanish 26 May 82 Extraordinary Issue, No 26, pp 95-100

[Text] Council of State

Fidel Castro Ruz, president of the Council of State of the Republic of Cuba,

Announces: That the Council of State has approved the following:

Whereas: Scientific and technical progress opens broad prospects for the peaceful use of nuclear energy and constitutes a very important factor for the socioeconomic development of the country and progress in the construction of socialism.

Whereas: The planned future economic development of our country includes important tasks related to the development of nuclear energy.

Whereas: The development of nuclear energy, because of its great complexity, requires the coordinated participation of different state organs and institutions whose activities must be the subject of the corresponding legal regulation in order to achieve greater effectiveness.

Whereas: The start-up and exploitation of the installations associated with the development of nuclear energy imply risks for workers exposed occupationally to radiation, for the population in general and for the environment, risks that must be prevented through the adoption of measures backed by legal norms that guarantee compliance.

Whereas: The appropriate legislation of the development of nuclear energy will also help insure fulfillment of the international commitments assumed by the Cuban state in this sector.

Therefore: The Council of State, aware of the importance of the use of nuclear energy for peaceful purposes in the construction of the socialist society, the advantage of having an effective legal regulation for the orderly development of this activity and to achieve its objectives, in use of the prerogatives conferred in clause c of Article 88 of the Constitution of the Republic, agrees to dictate the following:

Decree-Law No. 5[illegible]

"For the Regulation of the Peaceful Use of Nuclear Energy"

Chapter I

Objectives and Definitions

Article 1. The present decree-law has as its objective:

a) To establish the basic legal norms for the appropriate use of nuclear energy for peaceful purposes within national territory, guaranteeing that it serves the interests of all the working people and improves their standard of living.

b) To establish the measures that, considering the risks derived from operations related to nuclear materials, radioactive substances and other sources of radiation, insure protection of the health of the workers exposed occupationally, of the population living near the nuclear installations and of the population in general as well as of goods and the environment.

c) To regulate the way to meet the commitments assumed by the Cuban state through pacts and other international agreements on nuclear energy within national territory.

ch) To work toward uniformity in mechanisms to regulate and control activities related to the peaceful use of nuclear energy.

d) To organize effective accounting and control of nuclear materials, the physical protection of these materials, radioactive substances and other sources of radiation, the security of nuclear installations and radiological protection from the risks of exposure to radiation.

e) To establish the general conditions for granting the corresponding licenses.

f) To establish responsibilities and sanctions for noncompliance with [illegible] provisions.

Article 2. In order to facilitate the correct interpretation and application of the provisions of the present decree-law, the following terms are defined below:

a) Radiation: any radiation formed by directly or indirectly ionizing particles or by a mixture of the two.

b) Sources of radiation: a machine, device or substance capable of emitting radiation.

c) Exposure: act of a person being exposed to radiation.

ch) Worker exposed occupationally: person who works directly with sources of radiation or who, due to the nature of his job, is exposed to this radiation.

d) Nuclear material: any basic material or special fissionable material which, for the effects of the present decree-law, are as follows:

Special fissionable materials:
Plutonium 239; uranium 233; enriched uranium with isotopes 235 or 233; any material that contains one or several of the mentioned elements.

Basic materials:
Natural uranium; impure uranium and thorium; and any of the mentioned elements in the form of ore, alloy, chemical compound or concentrate.

e) Nuclear installation: any place where nuclear material is habitually used in quantities of more than 1 true kilogram with the exception of places where the materials are stored incidentally during their transportation.

f) Radioactive installation: radioactive installations are defined as:

1. Installations of any type that contain a source of radiation.
2. Buildings, laboratories, factories and installations where radioactive substances are produced, stored or handled.

g) User: the natural or legal person named on the required license for the start-up and exploitation of a nuclear or radioactive installation.

h) Risk: probability that a short or long-term harmful effect will occur, whether to the health of individuals or populations or to material goods or the environment.

i) Damage: any death or impairment of the health of persons or total or partial loss of material goods due to a radiological accident or waste disposal.

j) Radiological accident: any unforeseen event which can cause exposure of persons or the dispersion of radioactive substances in the environment in greater quantities than the limits set by existing regulations.

k) General emergency plan: set of planned actions to be carried out by each of the organisms responsible for a certain task in case there is a situation of nuclear emergency.

l) Situation of nuclear emergency: any radiological accident which, as a consequence, would mean surpassing the limits of exposure stipulated by the Cuban Commission on Nuclear Energy, keeping in mind the levels of acceptable risk for these cases.

Chapter II

On the Cuban Commission on Nuclear Energy and the Executive Secretariat for Nuclear Affairs

Article 3. The Cuban Commission on Nuclear Energy is the organ responsible for directing and controlling nuclear activities in national territory and, with this objective, will carry out the tasks that the Council of Ministers or its Executive Committee entrusts to it.

This commission is subordinate to the Council of Ministers.

The different organisms of the Central State Administration and the people's government organs, within their respective jurisdictions, will offer the commission the cooperation it requires for the fulfillment of its functions.

Article 4. The Cuban Commission on Nuclear Energy is aided in its functions by the Executive Secretariat for Nuclear Affairs, adscript to the Council of Ministers.

Article 5. The make-up and functions of the Cuban Commission on Nuclear Energy and the Executive Secretariat for Nuclear Affairs will be determined by the Council of Ministers.

Chapter III

On Licenses

Article 6. The license is the authorization, contained in an official document, granted for the realization of any pertinent act of importation, acquisition, use, operation, processing, transportation, transfer, evacuation, storage or exportation of radioactive substances or other sources of radiation and nuclear materials.

That document establishes the requirements and conditions for the exercise of these activities as well as the length of time it is valid.

The licenses to which the above paragraph refers will be granted by the Executive Secretariat for Nuclear Affairs according to the norms and requirements set forth in this decree-law and in the regulation dictated for that effect.

Article 7. In the case of important nuclear and radioactive installations, the license will be issued for a specific stage or phase. In granting these licenses, there will be approval for the following stages: emplacement, construction, start-up, exploitation and shutdown.

Chapter IV

On Systems of Regulatory Measures

Section 1

On Systems

Article 8. A system of regulatory measures is defined as the set of norms established for the regulation, approval, supervision and registration applicable to the importation, use, operation, storage, production, processing, transportation, evacuation and exportation of nuclear materials, radioactive substances and other sources of radiation within national territory, aimed at reducing the risks derived from these operations to the minimum.

Article 9. The systems of regulatory measures are as follows:

a) National System of Accounting and Control of Nuclear Materials.

b) Physical Protection System for Nuclear Materials, Radioactive Substances and Other Sources of Radiation.

c) Security System for Nuclear Installations.

ch) National Radiological Protection System.

Section 2

On the National System of Accounting and Control of Nuclear Materials

Article 10. The National System of Accounting and Control of Nuclear Materials is defined as the set of measures aimed at making accounting and control as well as reports and notifications required in this activity possible.

Article 11. The objectives of the National System of Accounting and Control of Nuclear Materials are as follows:

a) To contribute to the efficient and economic management of nuclear materials through the adoption of appropriate measures of inspection, measurement, inventory, registration, reporting and verification.

b) To guarantee fulfillment of international commitments that the Cuban state has assumed concerning nuclear materials used in national territory.

Article 12. The National System of Accounting and Control of Nuclear Materials is established at the national level and in every nuclear installation that uses more nuclear material than the minimum amount set forth in the corresponding regulation.

Article 13. The Executive Secretariat for Nuclear Affairs will be responsible at the national level for regulating, supervising and controlling the necessary measures to guarantee that the obligations of accounting and control of nuclear materials are carried out throughout national territory.

Article 14. In order to fulfill the above article, the Executive Secretariat for Nuclear Affairs has the following functions:

a) To regulate the pertinent acquisition, importation, use or operation, storage, production, processing, transportation, transfer, evacuation and exportation of nuclear materials.

b) To guarantee verification of the accounting and control of nuclear materials by each user of a nuclear installation in the country.

c) To carry out the corresponding procedures with the OIEA [International Atomic Energy Agency] concerning execution of agreements on this sector.

ch) The Executive Secretariat for Nuclear Affairs will represent the Cuban state in its relations with homologous organs of other countries and with specialized international organisms concerning accounting and control of nuclear materials. The Ministry of Foreign Relations will collaborate with the Executive Secretariat for Nuclear Affairs in everything related to these activities.

Article 15. The accounting and control in each nuclear installation that requires it will be done by the user of the installation involved, according to the regulation that the Executive Secretariat for Nuclear Affairs dictates.

Section 3

On the System of Measures for Physical Protection of Nuclear Materials, Radioactive Substances and Other Sources of Radiation

Article 16. The System of Measures for Physical Protection of Nuclear Materials, Radioactive Substances and Other Sources of Radiation is defined as the set of measures of containment, vigilance and physical care adopted to prevent the unauthorized use of nuclear materials, radioactive substances and any other source of radiation.

Article 17. The objective of the System of Measures for Physical Protection of Nuclear Materials, Radioactive Substances and Other Sources of Radiation is to create conditions that make it possible:

a) To prevent and limit the possibilities of unauthorized extraction and deflection of nuclear materials, radioactive substances and other sources of radiation.

b) To avoid the risk of acts of sabotage against installations that use nuclear materials, radioactive substances and other sources of radiation.

c) To prevent uncontrolled use of nuclear materials, radioactive substances and other sources of radiation.

ch) To provide the necessary information and technical aid to support the decisions that must be made in case the events expressed in clauses a, b and c occur.

Article 18. The Executive Secretariat for Nuclear Affairs, in coordination with the Ministry of Interior, will be responsible for regulating activities related to the physical protection of nuclear materials, radioactive substances and other sources of radiation adapted to the norms of the regulation dictated to this effect.

Section 4

On the System of Security Measures for Nuclear Installations

Article 19. The System of Security Measures for Nuclear Installations is defined as the set of measures that guarantee, under conditions of maximum security, the emplacement, plan, design, construction, start-up, exploitation and shutdown of nuclear installations, keeping in mind the specific risks of those installations.

Article 20. The System of Security Measures for Nuclear Installations has the following objectives:

a) To establish the general security conditions and requirements and answer for their fulfillment.

b) To guarantee the examination and approval of the emplacement, construction, design, start-up, operation and shutdown of nuclear installations.

c) Not to grant or to withdraw the corresponding license in case the established security conditions and requirements are not met.

ch) To adopt appropriate measures for shutdown once the useful life of the installation involved is over.

Article 21. The measures in this system include regulation of the following aspects among others:

a) Selection, evaluation and approval of emplacement.

b) Evaluation and approval of the project and design of the installation.

c) Verification of correspondence between construction and design.

ch) Control and supervision of the program controlling the corresponding guarantees and certificates of quality.

d) Establishment of requirements for the operational personnel and approval based on the level required in each case.

e) Approval and control of the start-up program of the installation.

f) Establishment and control of operational limits and conditions.

g) Approval and control of the operational program.

h) Approval of the plan of measures for emergency situations.

i) Verification of the efficiency of the security systems and devices.

j) Systematic control over the environment.

k) Establishment and control of the program for the shutdown of the installation.

l) Control of supplies and transportation of nuclear materials, components and installations.

Article 22. The Cuban Commission on Nuclear Energy is empowered to dictate the necessary regulations for the appropriate application of the System of Security Measures for Nuclear Installations. The Executive Secretariat for Nuclear Affairs will be responsible for supervising and controlling their application.

In order to receive cooperation in some of the functions assigned to it, it can establish technical advice committees consisting of its own skilled personnel or personnel from other organisms.

Article 23. The Ministry of the FAR, the Ministry of Interior and the local people's government organs, in coordination with pertinent national organisms, must organize national and local operation centers to confront emergency situations.

These organisms, in coordination with the Cuban Commission on Nuclear Energy, will adopt measures for emergency situations.

The Cuban Commission on Nuclear Energy will review, evaluate and approve general emergency plans and will advise on their integration with other, nonnuclear emergency plans. It will also evaluate the nature and magnitude of every radiological accident in order to determine whether it constitutes an emergency situation.

Section 5

On National Radiological Protection System

Article 24. The National Radiological Protection System is defined as the set of measures to insure that the exposure to radiation of individuals, the population and the environment remains within internationally accepted limits.

Article 25. The National Radiological Protection System has the following objectives:

a) To carry out, without additional risk, any activity related to the peaceful use of nuclear energy.

b) To insure the protection of the worker exposed occupationally, the population as a whole and the environment against the harmful effects of radiation.

Article 26. The Cuban Commission on Nuclear Energy is empowered to dictate the necessary regulations to:

a) Guarantee that any practice that implies exposure is justified; to insure that the established limits of dosage are never violated; and to maintain the amount of exposure at the lowest level that can be reasonably achieved.

b) Limit exposure from natural sources intensified by technological practices.

c) Limit exposure from the dispersion of radioactive substances in the environment, limit and control radioactive discharges, avoid the dispersion of radioactive contaminants that can affect man or alter the ecological balance and insure appropriate management of radioactive waste.

ch) Guarantee safe transportation and storage of radioactive substances.

d) Learn and evaluate the magnitude and consequences of every radiological accident.

Article 27. The National Radiological Protection System will be carried out at the national level and in every installation where nuclear materials, radioactive substances and other sources of radiation are used.

Article 28. The Executive Secretariat for Nuclear Affairs will be responsible for the organization, supervision and control of the National Radiological Protection System at the national level. To that effect, the Cuban Commission on Nuclear Energy will dictate the necessary regulations.

The Ministry of Public Health will be responsible for regulating this system in its X-ray installations and for carrying out operational control of radiological protection in the radioactive installations where there is no justification to have a radiological protection service of their own. It is also responsible for exercising the necessary medical supervision of all workers exposed occupationally in accord with the regulatory norms dictated.

The State Committee for Labor and Social Security will be responsible for drawing up the labor provisions that will be applied to the workers exposed occupationally based on job specifications, sex, etc.

Article 29. The Cuban Commission on Nuclear Energy will be responsible for integrally regulating and controlling activities aimed at preventing and avoiding radioactive contamination of the environment within the context of the National System for Environmental Protection and Rational Use of Natural Resources established by Law No. 33 of 10 January 1981.

Chapter V

On Civil, Administrative and Labor Responsibility

Section 1

On Civil Responsibility

Article 30. The enterprises and other state entities are responsible and have the obligation to pay for damages caused to other organizations or to private persons by the use or handling of nuclear materials, radioactive substances and other sources of radiation.

There is no obligation to compensate if the damage is caused by the recklessness or negligence of the victim but, in fairness and if the circumstances justify it, that obligation may also extend to this case.

The enterprises and other entities will have the right to demand what they have paid in compensation from the causer of the damage.

If it is not possible to determine the party responsible for the damage or if it is an insolvent organization, the state will be obliged to compensate.

Article 31. The demand for damages referred to in the above article and the extension and amount of the compensation will be adapted to the corresponding provisions of existing civil legislation.

Section 2

On Administrative Responsibility

Article 32. Infractions of the conditions and requirements contained in the licenses granted, according to Article 6 of the present decree-law, will be sanctioned with administrative measures, without prejudice to demanding penal responsibility for the infraction.

Article 33. The applicable administrative measures will be as follows, depending on the gravity of the case:

a) Suspension of the license for up to 6 months.

b) Revocation of the license.

Article 34. The measures in the above article will be imposed by the Executive Secretariat for Nuclear Affairs.

Article 35. The measures to which Article 32 refers will be carried out immediately and will have no appeal.

However, the Executive Secretariat for Nuclear Affairs can nullify the measure imposed at the well-grounded request of the violating entity.

Section 3

On Labor Responsibility

Article 36. The Executive Secretariat for Nuclear Affairs will communicate to the authorities empowered to impose disciplinary measures any violation by officials or leaders subordinate to them of the duty to impose disciplinary measures on the workers at nuclear installations or those who, in some way, are involved with nuclear materials, radioactive substances and other sources of radiation concerning the responsibility which can be incurred based on the existing legislation on responsibility and discipline of officials and leaders.

Final Provision

Any legal provisions and regulations opposed to the present decree-law which will go into effect upon publication in the GACETA OFICIAL DE LA REPUBLICA are repealed.

Given in the Palacio de la Revolucion in Havana City on 25 May 1982.

[Signed] Fidel Castro Ruz

7717
CSO: 5100/2003

ABILITY TO MAKE ATOM BOMB CLAIMED

Johannesburg THE STAR in English 29 Sep 82 p 29

[Article by Jaap Boekkooi: "Whose Basements Have a Bomb?"]

> [Text] Jaap Boekkooi discusses a style of diplomacy which involves playing a kind of nuclear blind man's bluff and counterbluff to create deterrence by revealing nothing.

A proliferation of recent books on South Africa's nuclear capability no longer ask if this country can make an atom bomb, but how many have already been made and stockpiled.

An estimate that South Africa has a stockpile of 10 nuclear devices is made by former atomic science bulletin editor Samuel Day in his new book "The Afrikana Bomb." (sic)

Day's estimate is based on the amount of enriched uranium--with plutonium the main ingredient of an atom bomb--which should have been produced by the giant Valindaba enrichment plant before it reaches full-scale production of 50 tons a year in 1985.

Day also says it is now fairly easy for Valindaba to make the highly concentrated weapons-grade nuclear explosives for bombs.

The plant has produced 45 percent enriched uranium as an emergency supply for the Safari nuclear reactor, which the Americans have refused to supply with fuel for years. This, says Day, can easily be reenriched to the 90 percent required for a full-fledged nuclear weapon.

Statements about the 45 percent enrichment were made by the Minister of Energy, Mr F W de Klerk, and former director of the Atomic Energy Board, Dr Ampie Roux, giving rise to suggestions that South Africa was trying to "tell" something about its nuclear capabilities.

Another nuclear book, "Two Minutes Over Baghdad," written by Israel's Uri Bar-Joseph and Amos Perlmutter, with Harvard University researcher Michael Handel, speculates on nuclear cooperation between South Africa, Israel and Taiwan.

This has led, the authors say, to nuclear warheads which can be fired from a 155 mm cannon; tactical weapons which can explode over a target 40 km away from firing.

On the heels of this came the announcement this month that Armscor had produced a new 155 mm cannon, the G6. This, as the announcement said coincidentally, could fire a Nato nuclear warhead accurately at a distance of 40 km.

This distance is the ideal one in the phase where guerrilla and conventional warfare start to overlap. But Armscor has denied it possesses nuclear shells.

The "Baghdad" authors again talk of a 155 mm cannon when they say this was the weapon used to fire a nuclear warhead which caused the now notorious "double flash" 8 000 m above the South Atlantic in September 1979, an event which caused world headlines and was seen as a sign of a South African explosion.

This, and allegations of close nuclear cooperation by the Israel-South Africa-Taiwan "pariah axis" mentioned by the "Baghdad" authors, is part of the flurry in international nuclear circles which has intensified since 1977.

In that year Russian and American satellite photo interpreters concluded that a series of constructions in a part of the Kalahari could only be a preparation for a South African underground nuclear test.

South African policy, as expressed by the Atomic Energy Board then and now, has been to deny the allegations, speculation and insinuations, to reiterate the country's commitment to peaceful nuclear purposes, and to maintain the lowest possible profile.

Nothing here of the open bragging match between traditionally hostile countries such as Pakistan and India, shaking their fledgling atomic fists at each other, with concurrent talk about an "Islam bomb" and waging a nuclear Jihad (holy) war.

South Africa's diplomacy in nuclear affairs is much closer to Israel's, a country estimated to have a nuclear stockpile of 200 bombs, according to the CIA and the "Baghdad" authors.

Both represent a style known as "bomb in the basement" diplomacy. This aims at playing a kind of nuclear blind man's bluff and counterbluff to create an atmosphere of deterrence by pure silence.

According to this line of diplomacy, by refusing to say whether it has atom bombs or not, South Africa can achieve much more than by demonstrating a bomb, which would have a destabilising effect.

Israel has developed this policy to a fine art. But also in South Africa a former Prime Minister is known to have expressed the view that the world must be kept guessing.

That view implied strict observance of a ban on the nuclear boast among government spokesmen, and there have been none of these for some years since the Finance Minister, Mr Owen Horwood, came close to one.

If Taiwan is included it appears that all three members of the alleged "pariah axis" are committed to bomb-in-the-basement diplomacy, especially because if there is nuclear cooperation, and one breaks the bond of silence, the others could easily be implicated.

This is, nuclear observers say, the scenario of such cooperation:

South Africa has the "gunpowder" for the bomb and the technology to make it. This would be a matter for Armscor to refine, and the Atomic Energy Board could quite correctly continue to reiterate the "peaceful purposes" of nuclear research. But South Africa still falls short in the means to deliver a nuclear device.

Israel and Taiwan need the "gunpowder" but have extensive technology to deliver the bomb, not only in aircraft and missile systems, but also in radar and anti-missile systems. To them the use of missile-prone Mirages as carriers would be primitive.

This scenario suggests that the three countries would do swops--material for technology. For all three have different needs.

South Africa, as has been said many times, has no need or use for an atomic bomb. It cannot be used against guerrillas in a border area, and its use on cities housing anti-Pretoria guerrillas is unthinkable and would risk retribution, possibly even involving a superpower. But South Africa, in a conventional war, could find good uses for a tactical nuclear shell, such as one fired from a 155 mm cannon.

Taiwan, on the other hand, thinks it has an urgent need for nuclear bombs. For if it were attacked by mainland China an armada of ships would have to be used, a perfect target for nuclear weapons.

Israel's needs, the scenario writers say, fall between those of the two other countries, with more accent on materials than technology.

Now for the great paradox.

Earlier this year the Minister of Foreign Affairs, Mr Pik Botha, threw a large spanner into all these scenarios and speculations, the bluff and counter-bluff, by announcing that the Government was "considering" signing the global agreement banning all nuclear weapons, the American-inspired Non-Proliferation Treaty.

Mr Botha was, in fact, trying to say: "We have made no atom bombs, and we promise not to make or use them. If we have made any, we will defuse them. And you can come and inspect our Valindaba plant to see whether we make any nuclear explosives there and to inspect the books which show to whom we sell enriched uranium."

It was an extraordinary statement and led to much speculation which by now has died down.

But one observer long involved with nuclear affairs told me recently: "I think Mr Botha's statement was a nuclear red herring. South Africa is in a position of strength and will never sign the Non-Proliferation Treaty.

And so the game of bluff and counterbluff continues and whatever bombs there may be they remain solidly in the basement.

South African-born nuclear strategist, Professor Jack Spence believes they would emerge only when all that is left is the "apocalyptic option."

Of all local subjects in South Africa the "Pretoria bomb" remains the most unmentionable.

CSO: 5100/2

ROLE OF KOEBERG IN POWER SCHEME DISCUSSED

Johannesburg THE STAR in English 25 Sep 82 p 7

[Article by John Bentley and James Clarke]

> [Text] The Drakensberg scheme...water from the Tugela is fed along a network of canals back to the Jager's Rust Pump Station where, instead of being pumped up through the old T'zamenkomst Tunnel, it is pumped to the lower (Kilburn) dam. The power station's underground turbines then pump water through tunnels to the upper "dam-within-a-dam," Driekloff. The process is reversed at periods of peak electricity load, when water is allowed to run down the tunnels, dropping 500 metres at 19 metres a second to turn the turbines.

Power Scheme 1--A Mountain That Pushes Out Power

A mountain that generates electricity sounds like the perfect ingredient for a modern fairy story.

Except that such a fairytale mountain already exists, right here in South Africa. And even more are in the offing according to Escom's master plan for the next few decades.

The first of these magical hillsides is on the slopes of the Drakensberg range near Olivviershoek, not far from the spectacular Amphitheatre, gathering place of the giants in local folklore.

Invisible

Water pumped uphill between two reservoirs is allowed to run down again--all through tunnels bored deep in the hillside--using gravity to generate power which takes up the overload on the national energy grid during periods of peak demand.

The enormous tunnels and turbines would have done the legendary giants proud. And the fact that the workings are virtually invisible from the surface adds to the fairytale quality of the scheme.

The brainchild of Mr Bruno Graber who heads Escom's hydroelectric section, the Drakensberg Pumped Storage, Scheme is a dual-purpose project realised in co-operation with the Department of Water Affairs.

Along with its ability to generate electrical power, it is used to pump water from Natal's Tugela River up over the 'Berg into the Sterkfontein Dam on the Orange Free State side.

South Africa is a relatively dry country with erratic rainfall, so hydroelectric power in the normal sense is not an important part of Escom's electricity-generation capacity.

There are only two conventional hydropower stations in the Escom network, at the Hendrik Verwoerd and P K le Roux dams. Their generating capacity is 540 megawatts, less than three percent of the total generated nationwide.

They are operational only when the dam levels are high enough.

Change

But pumped storage schemes will change the situation markedly over the next few years.

The Drakensberg project, with a peak generating capacity of 1,000 MW, has raised the proportion of locally generated hydropower in the system to eight percent.

Pumped storage schemes are net users of electricity, consuming more power to pump water back than they produce in the "generating mode."

Their function is to generate power during periods of peak load on the system. Pumping is then done in periods of low demand.

"In fact, it's a way of storing electricity. You could call it an 'hydraulic battery,'" says Mr Tony Holthuysen, deputy manager at Drakensberg.

The use of electricity fluctuates continuously according to consumer demand. Periods of high demand (peak load) are between 7 am and midday and during the evenings from about 6 to 10. Lowest demand is from around midday on Saturday to early on Monday morning.

Invaluable

In its first months of operation the Drakensberg scheme has proved invaluable, coming to the rescue several times when power imported from Cahora Bassa has cut off.

Plans are now under way for a similar scheme using water from the Palmiet River, a few kilometres south of Grabouw in the Cape.

The project, which could be completed by 1988, will pump water into the Steenbras reservoir, adding some 30 million cubic metres of water a year for use by the Cape Metropolitan area. Further schemes on the Tugela are also under investigation. All such "peaking plants" will have a dual function, transferring water from one dam to another and operating partly as normal hydro and partly as pump storage. An elegant way of eating your cake and still having most of it!

Power Scheme 2--The Giant That Keeps Growing

Escom, South Africa's burgeoning electricity utility, is a giant, even by world standards.

Growing at a rate which has seen it double in size over the last 10 years--following similar performances in each of the two preceding decades--the national supplier of electricity currently ranks with the third-biggest utility in the US.

And this spectacular growth pattern is to continue, with one complete new 3,600 MW coal-fired power station scheduled for completion each year from 1985 up to the end of the century.

There is also the possibility of more hydro-electric pump-storage schemes to follow the recently completed Drakensberg project and the Palmier scheme in the Cape, as well as more nuclear stations to follow Koeberg, should the economics justify such a step.

The present rate of expansion--8.8 percent a year--is over twice the annual national increase in demand for energy.

But, points out Escom's chief engineer (system planning), Mr Bruce Norman, electricity is supplying an ever-increasing proportion of South Africa's energy needs.

The trend is a logical one, Mr Norman says. "Electricity is one of the most useful and efficient forms of power. It is flexible and can be used in almost any application."

These properties mean electricity is playing an important part in efforts to decrease the country's dependence on oil.

South African Railways is converting from diesel to electric locomotives. Country towns which used to produce their own power with diesel-fired generators are turning to Escom. Mines are replacing diesel vehicles with electrically driven versions.

The network of electrical power is continually spreading, supplying more rural areas and the national states, such as Transkei, Bophuthatswana and Venda.

Projects like the electrification of Soweto will increase demand still further.

The growth in demand for electricity will continue at a higher level than the overall increase in demand for power for many years to come.

"We expect it to tail off from the present increase of 7.8 percent a year to 6.6 percent by the year 2000, dropping to 4.5 percent by 2050," Mr Norman says.

The new generation of coal-fired power stations will be the backbone of Escom's "baseload" plant for the foreseeable future.

Sited in the Eastern Transvaal coalfields, they are gradually transforming the vast, flat skyline with their tall chimneys and curved cooling towers.

The sixth and last of the giant 600 MW sets that make up the Matla power station will be commissioned next year. Another giant, Duvha, currently has four sets commissioned. The final two will be operating by 1984.

Then will follow the Tutuka station near Standerton, and after that a series of names which by their ring evoke sensations of mysterious power and might: Lethabo, Matimba, Khutala, Majuba, Lekwe...

All will be 3,600 MW stations, made up of 600 MW units, though 900 MW and even 1,300 MW units are not ruled out for the end of the century.

An important innovation planned for several of the new giants is "dry cooling," which will cut water consumption dramatically.

The first will be at Matimba, which is to be sited in the relatively dry Ellisras area. The technology is well proven--Escom has run dry-cooling on 200 MW sets at Grootvlei. But the scale will be totally new: there are no other 600 MW dry-cooled sets in existence.

"Dry towers are more expensive to build, and lead to a loss of efficiency in the plant, but water savings are appreciable," says Mr Ross Hatton, manager of the conventionally-cooled Duvha station.

A conventionally cooled station loses something like 30 million litres of water a tower a day. Dry cooling cuts that figure by 64 percent...against an increase in operating and running costs of around eight percent.

There are no plans to convert conventional stations to the new system: given the 40-year life of a station, that would be uneconomic.

The dry-cooled units already approved--so far there are 12 on order--will make an appreciable difference to Escom's water consumption, currently running at about 1.8 percent of the national total.

The new coal stations will be tied into a new 800 kilovolt "supergrid," superimposed on the present 400 Kv national grid.

This will allow more economic transmission of power over long distances, allowing reinforcement of the system in Natal and the Cape.

"Overall costs are considerably cheaper, though the cost of terminal equipment is high," says Mr Norman.

Another solution to the problem of power for areas far away from the coalfields is nuclear power--and his is one of the reasons given by Escom for the decision to commission the Koeberg station in the Cape.

Koeberg's first giant 922 MW set will go on stream in 1983, the second in 1984.

There are no concrete plans for further nuclear stations within the next ten years. But Escom is fully aware that an alternative to coal will have to be found before the "coal crisis" hits South Africa. By its estimates, problems with coal supplies could begin by "around the year 2030."

The third ingredient in Escom's power formula is pumped storage.

First in a series of hydro-electric projects that will use "pumped water" to generate power during peak load periods, so easing the strain on the grid, is the Drakensberg scheme on the Tugela.

Last winter, problems with shut-offs in the supply from Cahora Bassa forced frequent load-shedding. Now, admittedly helped by a comparatively mild winter which has seen peak demands somewhat lower than expected, though still higher than last year, Escom is in a position to cope with cuts in supply.

The recently approved Palmiet pump-storage in the Cape, and possibly further schemes on the Tugela, will give even greater self-sufficiency, though they will continue to take Cahora Bassa's cheap "natural" hydro power whenever it is available.

With coal as its "anchor," nuclear energy as a supplement and possible replacement, and pumped storage to handle periods of heavy demand. South Africa's electricity giant is confident of satisfying the country's ever-growing power appetite well into the 21st century.

Power Scheme 3--Our Nuclear Christmas Present

In a few weeks' time Koeberg's number one reactor will be loaded with its French-made uranium fuel. Then, soon after the New Year, the atomic reaction will begin to heat water for the conventional steam-driven turbines and, slowly at first, power will be fed into the nation's electricity grid.

By next winter the turbines will be spinning full bore and a mere 120 tons of natural uranium will be producing as much electricity annually as 3-million tons of coal.

Not long afterwards number two reactor will be fueled up and the coalless Western Cape will be producing from its relatively small nuclear power station far more power than the huge Cahora Bassa hydro scheme on the Zambezi.

Thus far South Africa's nuclear energy scientists are satisfied. It has been expensive (Koeberg, in the final analysis, will probably have cost us R2 000 million but, economically, it has been worth it).

To have brought to the Western Cape the same amount of power via coal-fired stations would have cost a great deal more, and the environmental impacts (smoke, water pollution from mining, power lines) would have been enormous.

Will there be more Koeberg-style light water reactors soon?

of this century, according to an Escom spokesman. But says the President of the Atomic Energy Board, Mr Wynand de Villiers: "A nuclear development plan is essential."

There is really only one viable alternative to going increasingly nuclear: to import hydro-electricity from Zaire which on one bend in the Zaire River, could supply us with many times more power than we will probably ever need. In fact the potential site is nearer to Cape Town than Cahora Bassa is to the Rand.

But the political instability of Central Africa makes it an impossible dream.

What of other alternatives?

--Coal: We have enormous reserves (110 000 million tons are economically extractable which, at present extraction rates, would last nearly 1 000 years) but coal is increasingly being looked upon as a multiple-use chemical. It can be broken down into oil for a start and could, potentially, make us independent of oil imports.

--Hydro: The Orange River's two hydro schemes supply just over half the equivalent of a single reactor at Koeberg (540 MW) but are used only as reserve for peak loads or emergencies. The Drakensberg pumped storage scheme supplies 1 000 MW but, again, is for peak load times. The Tugela has a fair amount of latent energy but, all told, hydroelectricity is unlikely to supply more than, say, eight percent of our requirements over the next half century.

--Solar power: Although the sun's direct power could bring electricity to remote areas and supply a third of the power needs of houses in South Africa, it is unlikely to make significant contributions to the overall energy picture.

Solar power is potentially of importance in bringing down the cost of living for suburban dwellers (via roof collectors to heat water) and farms. It is grossly starved of research funds according to solar energy scientists. It requires a minimum of 30 researchers and R20 million a year--it gets about $500 000 and has three researchers.

--Wind power has some interesting possibilities. For generations South Africa has used it for pumping water. Research in South Africa but mostly outside indicates windmill generators could play a useful supplementary localised role.

--Conservation if industry and commercial buildings were designed to be energy efficient it should be possible to save as much as half the energy required by buildings and a quarter by industry. The way car engines were modified after the oil crisis, thus dramatically reducing oil consumption, has shown what can be done when the need is there.

CSO: 5100/2

PHYSICIST REPORTS ON THREAT OF KOEBERG MELT-DOWN

Johannesburg THE CITIZEN in English 8 Oct 82 p 11

[Text]

CAPE TOWN. — A major disaster at Koeberg could result in the deaths of 350 000 people in and around Cape Town, according to a physicist of the Universify of Cape Town.

Speaking in a debate about the use of nuclear power in South Africa, held in Green Point, Dr David Aschman, senior lecturer at UCT's Department of Physics, said Eectricity Supply Commission grossly underestimated the short-term death toll from such a disaster.

He said a melt-down, where the core of the reactor becomes exposed and the nuclear fuel melts and burns its way through the reactor shell and into the earth, combined with other circumstances, could lead to 100 000 people being killed immediately and a further 250 000 dying over a longer period of time.

Dr Aschman said that while the death toll from a major nuclear accident would be huge, without taking into account injuries, genetic defects and other consequences, the probability of one occurring was extremely small — about one in a billion for each reactor in a year.

Speaking in favour of nuclear power use in South Africa to a lively audience, he said the Republic should have nuclear power, but not yet.

"South Africa does not need nuclear power now because there is still the problem of storage of waste material.

"Koeberg will have something like 75 tons of uranium fuel in it at any one time. One third of this will be replaced every year, meaning that about 20 tons of waste will be produced annually."

Dr Arnold Abramovitz, associate professor in the Department of Phsychology at UCT and acting chairman of Koeberg Alert, said South Africa needed nuclear power" like it needs a hole in the head." — Sapa.

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SOUTH AFRICA

BRIEFS

FAITH IN NUCLEAR POWER--Cape Town--Foreign countries now realise that the Republic's uranium enrichment process is South African and is successful, the managing director of the Uranium Enrichment Corporation, Dr Wally Grant, says. Speaking at the Stellenbosch branch of the Akademie Vir Wetenskap en Kuns, Dr Grant said political pressure had almost destroyed cooperation between South Africa and overseas countries in the field of nuclear power. He said the provision of nuclear power fuel remained a problem. As the demand for electricity increased, nuclear energy would probably have to be used to a greater extent. South Africa and countries abroad had an enormous trust in nuclear power, Dr Grant said. [Text] [Johannesburg THE CITIZEN in English 9 Oct 82 p 9]

CSO: 5100/2

NEW EFFORT UNDERWAY TO EXPORT NUCLEAR TECHNOLOGY

Paris LES ECHOS in French 1 Sep 82 p 6

[Article by Didier Duruy]

[Text] India, China, Belgium: France's involvement in nuclear power programs now extends in all directions. It is true that the need to export has never been quite so urgent as it is now. It would actually come as a great surprise if the government were to authorize EDF [French Electric Company] to begin work on more than five nuclear units in 1984-1985. And even in this list, one reactor would only be there on an optional basis.

The new phase of France's nuclear program will be determined toward the end of this year, once the first conclusions of the energy planning commission have been released. This commission has replaced the now defunct PEON [Advisory Commission on the Production of Electricity from Nuclear Sources] commission.

As a consequence, it is time for French industry to try to move outside France to collect the dividends of its earlier programs and technological efforts. This is a difficult job, and one at which our industry does not excel. The economic crisis and the oil glut, even if it is only temporary, are slowing down investment in energy programs. Moreover, the financial crisis does not favor nuclear energy, which gobbles up investments.

This means there will be problems with exports and a slowdown in French electricity demand.

However, there is still one solution: to sell nuclear kWh abroad. Switzerland, Italy, the Netherlands, and Spain, to mention only the most interested countries, are potential buyers.

But this can only happen if the appropriate political decision is made.

Why not try this? Nuclear energy is an excellent example of an advanced technology mastered from A to Z by our industry and government organizations. Such key sectors are not so numerous that we can afford to let such an opportunity slip through our fingers. Jean-Pierre Chevenement is convinced of this. He views nuclear energy is a field which can be an excellent source of jobs.

Sensitive Cooperation with Belgium

Etienne Knoops, the Belgian minister of energy, will meet in Paris tomorrow with his counterpart, Edmond Herve. On the agenda are Belgium's participation in the construction of the Chooz nuclear power plant in the Ardennes, and more generally, the establishment of cooperation between the nuclear power industries of the two countries.

The creation of a "balanced" form of cooperation, which was stated as a goal last February during a previous meeting of the two ministers, actually depends largely on the Belgian nuclear program. And on this point, the situation is far from clear, and will not be so at best before October, after a new senate debate.

Reciprocity and balance do imply Belgium's participation in Chooz, but also a French contribution to Doel 5, Belgium's future nuclear power plant.

Not yet knowing when this new project will be begun (there is talk of first going back to coal), it is hard to draw up a plan for cooperation. But time is pressing, at least on this side of the border.

The electricity exchanges also contained in the cooperation program are no further advanced. There are some differences of opinion remaining between the private Belgian companies and EDF about the price of this electricity.

All things considered, it will be more difficult to reproduce with Chooz and Doel the program established between Paris and Brussels some years ago for the first nuclear power plant at Chooz and at Tihange, on the other side of the Quievrain.

The new environmental movement which has swept Belgium in response to the affair of the wastes dumped off the coast of Spain (a train transporting wastes to the port of Zeebrugge was stopped) also threatens to delay matters.

France Again Gains a Foothold in China

A Chinese scientific mission is expected to come to Paris at the end of September, at the invitation of the CEA [Atomic Energy Commission]. The discussions will focus on technology transfers which can be made from French industry to Chinese enterprises. The principle of this meeting was approved during last week's visit of a delegation of high-level French officials to China.

The members of this delegation (representatives of the ministries of foreign trade, foreign affairs, industry, and the economy, along with the CEA) were primarily concerned about "gaining a foothold in China" through this visit.

While the statements made by Chinese officials at the end of last year were interpreted in France as a definite abandoning of any nuclear ambitions, the Americans and British pursued their dealings with the Canton Electricity Company. Consequently, it was time to let the Chinese know that French industry would still be ready to build a power plant consisting of two reactors, each with a 900-MW capacity.

The visit of the French delegation did let us get a better idea of the Chinese intentions, though we must realize that no movement in this process can be expected overnight--"perhaps in 6 months," one member of the delegation told us. It has now been agreed that a joint company will be set up to operate this plant. The local electricity company will hold 60 percent, with the balance held by the China Light and Power Company of Hong Kong.

We must also realize that the construction of this nuclear power plant will only become a reality if the neighboring British colony of Hong Kong supports the project. Peking is not able to finance the plant on its own. Hong Kong does need electricity and is reportedly prepared to buy from 50 to 60 percent of the electricity produced by the Cantonese plant, thus providing financial backing.

In addition, a long term agreement would protect the future of the British colony beyond the fateful date of 1997, when the Sino-British renegotiation of the status of Hong Kong is to take place.

Technology Transfers

But we haven't won the game yet. We will have to learn the price that Sir Lawrence, the president of the China Light and

Power Company, will agree to pay for electricity from Canton. The Chinese have proven their ability as skilled legotiators, and should be able to play off the French, Americans, and British against each other to raise the bids.

Peking has no intention of continuing to purchase power plants from foreign countries indefinitely (its finances wouldn't allow it to do so, at any rate). Consequently, it wants its technicians to be involved in the construction of the Canton power plant. Such a project therefore includes a technology transfer, which will be discussed in Paris this month.

In this matter, the French government has taken the bull by the horns and is out in front. Private industrialists were also present in China during the visit of this delegation, but were acting there on their own initiative.

At a time when people in France are still trying to find the best structure for favoring nuclear exports, this desire to discuss government-to-government may well cause some grumbling.

This is especially true as the Chinese would like EDF to take part in this project. And for the conventional part of the plant, they would also like to have a joint Franco-British bid, with Alsthom-Atlantique and General Electric working in association. But the French officials have opposed this.

French companies, which have been making contacts with foreign markets in a pragmatic way for several months now, do have time to get organized. Especially as, even in Peking, nuclear energy isn't supported by everyone.

More information should be available after Mrs Thatcher's visit to China and Hong Kong.

Controls Affecting Relations with India

The Franco-Indian negotiations on the delivery of enriched uranium will be no picnic. The mission was to be led by the director general of COGEMA [Nuclear Materials Company]. He has just postponed his departure for New Delhi to a later date. The Indian press is sharply criticizing the demands being made by the French.

The postponement of the meetings is not officially motivated. Authorized sources report that during August, Paris apparently demanded more extensive controls. This would tend to prove that France has maintained a certain continuity in its approach to the dangers of proliferation, in spite of political changes.

(To date, the attitude of our leaders on nuclear exports has been shrouded in secrecy). In any event, New Delhi reportedly rejected the French plan, so that there is now no reason for the commercial and financial negotiations which Mr de Wissocq was to have begun, at least for the time being. The contract involves about 40 million francs.

The reader will recall that France intervened in this matter at the joint request of Mrs Gandhi and President Reagan. The entire operation could be in danger, if we are to believe the Indian press. According to our colleagues, the Gandhi government might put in the balance the weight of some purchases it has made from French industry, such as the Mirage 2000 aircraft.

In Paris, though, people are still optimistic about the chances of reaching an agreement with New Delhi in the more or less long term. Perhaps the upcoming conference of the International Atomic Energy Agency may afford a chance to renew contacts.

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SAINT-LAURENT-B PLANT HAS MECHANICAL PROBLEMS

Paris LES ECHOS in French 9 Sep 82 p 13

[Article by Didier Boret]

[Text] The Saint-Laurent-B nuclear power plant has had a long series of problems. The first nuclear power plant at Saint-Laurent-des-Eaux, located on a loop of the Loire river, was without a doubt a great success for French technology.

After the experimental phase at Chinon, Saint-Laurent-A demonstrated the capability to use a totally French system (natural uranium-graphite-gas) to produce electricity. The first 500-MW unit went on line in 1969, and the second in 1971. Incidents did occur, as they do in any industrial facility, but it is generally agreed that this plant is operating well, in good safety conditions, and that it has made a significant contribution to the French electric power system.

The first steps taken on the second plant--Saint-Laurent-B-- are clearly more faltering, if we are to judge by the many shutdowns since the two units (each 900 MW) went on line in January and June 1981. It isn't actually the nuclear technology itself which is causing the problems, but rather the secondary part (the turboalternator and related equipment), which is being used at Saint-Laurent-B for the first time. The new equipment, particularly the dryers, steam superheaters, have had some anomalies which have caused shutdowns, repairs, and operation at reduced power until there can be certainty about the good behavior of the equipment. Defects have been reported on some seal rings, which could cause some of the valves to crack.

Quite recently, the plant's directors announced a 3-month shutdown of both units in order to examine the alternator rotor, because an anomaly was found on an identical piece of equipment at the Chinon-B plant.

Saint-Laurent-B to date has hardly contributed to the nation's power supply.

The CFDT [French Democratic Confederation of Labor], criticizing these failures, has pointed out that since this plant went on line, it has actually operated for the equivalent of only 53 days.

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BRIEFS

NUCLEAR PLANT FOR CHINA--Last weekend a French mission composed of six people arrived in Peking to discuss the project to have France build a nuclear power plant in southern China. The delegation, led by Mr Chahid-Nourai, a staff director at the ministry of foreign trade, was made up of representatives from the ministry of foreign affairs and staff members of the CEA [Atomic Energy Commission]. French sources reported that this delegation came to examine China's overall intentions about nuclear power, and also to discuss France's capabilities in this area. The plant which France is proposing to build for China would have a power of 900 MW and would be built in the province of Canton. British, Japanese, and American companies have also expressed an interest in this project, which would supply electricity to Hong Kong. [Text] [Paris LES ECHOS in French 23 Aug 82 p 6] 7679

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